

IRON AGE

MARCH 20, 1952
VOL. 169, No. 12

THE IRON AGE
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DIGEST

of the week in metalworking

IS COKE SHORTAGE POSSIBLE IN MID-1953?

PAGE 51 This will be a record year for construction of coke ovens, which make a basic ingredient of pig iron. Yet Defense Solid Fuels Administration is jittery, fearing that a coke shortage is possible in mid-1953. Too many overage ovens are producing at a top rate and gas hits cokemaking hard.

ORE HAULERS WATCH WEATHER, GET READY

PAGE 52 Iron ore shippers are watching the weather and toeing the line for an early start in the hauling season. With expanded fleet capacity, they will try to break the peace-time record of 89 million gross tons, set last year. A total movement of from 90 to 95 million tons of iron ore is foreseen for 1952.

WHY PREACH BENEFITS OF CAPITALISM?

PAGE 54 Management can best defend the private enterprise system through what are known as "educational programs." These are changing from the paternalistic patter of yesteryear to planned, sincere, scientific projects to get the worker to see the light. To succeed they must start from the top.

RAIL STRIKE MAY BE DRESS REHEARSAL

PAGE 56 The recent strike against the New York Central Railroad may have been a dress rehearsal. Since the Army is technically operating the railways since the 1950 seizure order, the concerted action of the rail unions may have been a test. Now rail unions may fight the Army in court.

DETROIT AUTO ENGINE PLANS UNCERTAIN

PAGE 74 Expiration date of priority classification for high compression auto engines is approaching. This throws a shadow of doubt over new engine plans of several producers. The present priority runs out Apr. 15 when a new designation goes into effect. It's hoped this will be a mere extension.

WESTERN STEEL OUTPUT BEATS ESTIMATES

PAGE 79 Steel production in the seven western states was almost 500,000 tons over the most optimistic predictions. The year's yield was nearly 4.9 million tons. Large producers without finishing facilities help explain the discrepancies. Industry newcomers will be even more important in '52.

DO YOU WANT NON-RATED TOOL ORDERS?

PAGE 81 Some machine tool builders are becoming gloomy. These are the people whose backlog is not up to the industry average. They want the right to take on non-rated orders as warranted. But heavier tool order volume is expected as demand grows for special tools and for Air Force projects.

NOTCH SENSITIVITY AT HI-TEMPS EVALUATED

PAGE 91 NACA has found that at short times to rupture strength of notched low alloy bolting and boiler steels at 932°F exceeds that of unnotched bars. The amount depends primarily on depth of notch. With increasing time to rupture, notched strength falls well below that of unnotched specimens.

TITANIUM PROPERTY AIDS SILVER BRAZING

PAGE 96 Non-brazing qualities of titanium have proved helpful in silver soldering a type 321 stainless steel assembly in a fused potassium chloride-sodium chloride salt bath. Titanium strips around assembly act as dams and hold the silver solder in place. The salt bath operates at about 1350°F.

FOUR NEW MACHINING METHODS EVALUATED

PAGE 103 Electrolytic, electro-arc, electro-sparking, and ultrasonic processes show promise for such machining jobs as tool grinding, die finishing, and shaping titanium jet engine disks. Two of these processes are already being used commercially. They may solve the diamond bort shortage.

SOME LOSS OF STEEL PRODUCTION CERTAIN

PAGE 133 By midweek steel companies began curbing production facilities to get ready for a strike—if it came. They couldn't wait for the union wage-policy committee's decision on postponement. This meant that some steel production would be lost—even if the strike didn't come off as scheduled.

RAM CORES FASTER, CHEAPER AND BETTER

NEXT WEEK Complex cores can be rammed better, faster and at lower cost in a new, automatic core making machine in use at Buick. Only hand operations left are inserting wires where needed, putting driers in place, and transferring driers with cores to oven conveyor. Turntable indexes five stations.

Only with B. F. Goodrich grommet belts can you make these savings!

*Save 3 ways! Investigate today!
Write or mail coupon*

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord section as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of

the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give $\frac{1}{2}$ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

They cost no more

BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V Belts BY
B.F. Goodrich
FIRST IN RUBBER



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Dept. IA-3
Akron, Ohio

- ☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.
- ☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

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The Steel Crisis

DON'T be confused about the steel wage-price crisis. There are a few simple facts behind the high sounding reports from Washington.

The steel industry wants neither a price increase nor a wage increase. Mr. B. F. Fairless, U. S. Steel head, said this before the WSB—so did other steel people. He argued that a wage and price advance would bring another inflationary binge.

The Steelworkers' Union wants a big wage increase come hell or high water. They aim to get it—with the help of the Administration.

Steel industry people argued that if a wage increase is absorbed by steel firms it will come out of federal taxes. Mr. Murray derided the sincerity of the industry's stand. He claims an increase is warranted and that the industry can afford to give it—without a price increase.

Top OPS people have been attempting to maneuver the steel industry into a small Capehart Amendment price increase. Their tactics are: if the industry gets a price adjustment for "past" increased costs it can hardly ask for another one to meet the current wage bill coming up. Using one of Mr. Truman's words, that is so much eye wash.

The industry doesn't care what words, actions or shenanigans the Administration uses to offer a price increase. If wages are going to be raised there must be a price increase to match such a raise—that is the industry's stand.

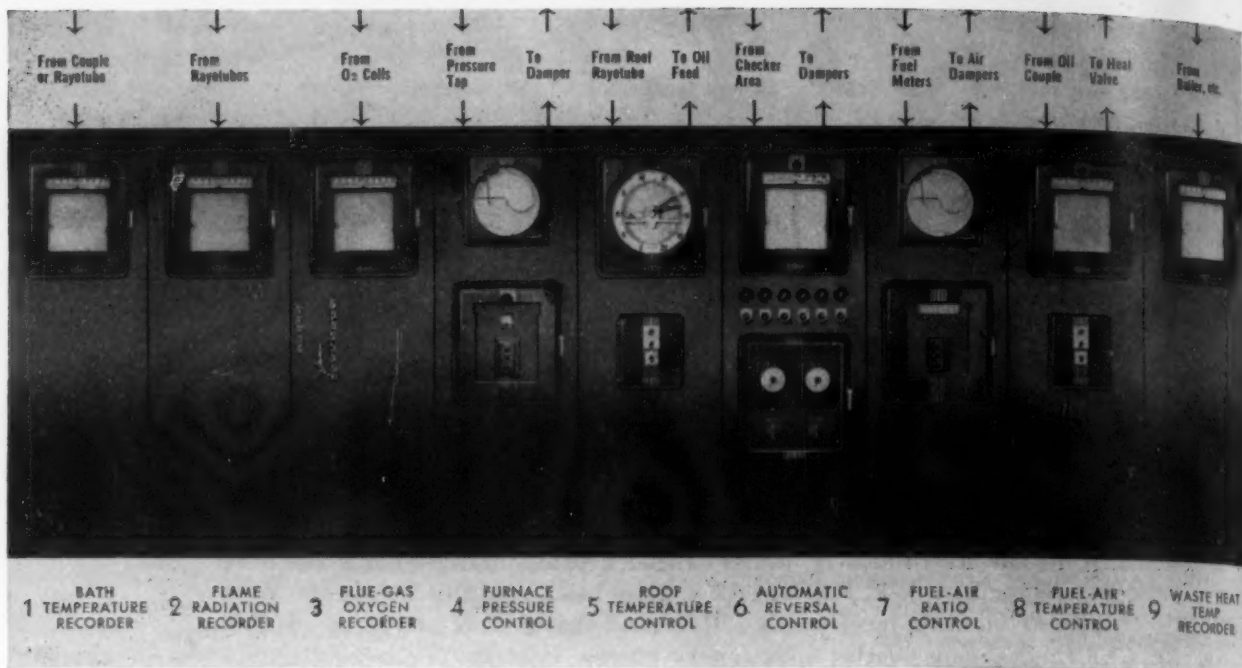
Higher steel costs, because of expansion, ore development, wages, materials and taxes, must come from the selling price of steel—if the industry is to remain healthy.

Steel labor will get a big slice of what it has asked for. But it won't get anything unless there is a price adjustment. Only the government can allow this so long as steel is under price control.

Mr. Truman's lieutenants must approve a price increase big enough to match a wage increase—else there will be a strike.

A strike would be a White House doorstep baby—conceived by the marriage of labor and government and stepfathered by a reluctant steel industry.


Editor



HOW MANY OF THESE 9 OPEN-HEARTH HELPERS CAN YOU USE?

THE open-hearth instruments shown above are used for four principal reasons . . . either to increase production, improve quality, save money, or give information which helps in planning future improvements.

1. Bath Temperature Recorder gives information which helps increase production and raise quality. Either thermocouple or Rayotube types available. Bath measurements are rapidly becoming standard practice in progressive mills and foundries.
2. Flame Radiation Recorder is a fuel engineer's research tool. Gives facts not otherwise available.
3. Oxygen Recorder saves fuel by showing combustion efficiency . . . regardless of stage of process or type of fuel. An "advanced" instrument well worth investigation by qualified engineers.
4. Furnace Pressure Control saves fuel by holding products of combustion in furnace for proper time and by helping smooth out the heating of checkers; lengthens refractory life by regulating air infiltration.
5. Roof Temperature Control speeds production by making it safe and easy to hold furnace continuously at maximum temperature; saves fuel and refractory, too.
6. Automatic Reversal Control often leads the parade for its combination of labor saving, checker saving, fuel saving, and general process improvement.
7. Fuel-air Ratio Control and related equipment is exactly what's needed for high-production heating speed and fuel efficiency when an open-hearth furnace burns a mixture of fuels, or switches fuels frequently.
8. Fuel Oil Temperature Control maintains correct viscosity of oil and therefore helps maintain even burner action and correct combustion.
9. Waste-heat Boiler-temp Recorder gives information for efficient combustion and proper boiler operation.

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| <input type="checkbox"/> Flame Rad. Rec. | <input type="checkbox"/> Auto. Reversal |
| <input type="checkbox"/> O ₂ in Flue Gas | <input type="checkbox"/> Fuel-Air Con. |
| <input type="checkbox"/> Furnace Press. Con. | <input type="checkbox"/> Fuel Temp. Con. |
| | <input type="checkbox"/> Waste-heat Temp. Rec. |

Dear Editor:

Letters from readers

Alcoholism Costs

Sir:

Your article "Alcoholism Costs Industry Too Much," appearing in your Feb. 21 issue, was the best one I've ever read on alcoholism in industry.

J. HARRINGTON
Administrator

Harworth Hospital
Detroit

Tool Steel Directory

Sir:

We noted with interest on p. 228 of your Mar. 6 issue the listings of the new tool steels and carbides since 1949. These are of concern to us and we would appreciate knowing if you have a directory of these that would be available for purchase, similar to your 19th edition of "The Iron Age Directory of Tool Steels."

J. C. VILLA
Purchasing Agent

J. L. Clark Mfg. Co.
Rockford, Ill.

The 1952 volume of our "Directory of Tool Steels and Carbides," the twenty-third edition, is just off the press. The price is \$2.00 a single copy, less in larger lots.—Ed.

Revision

Sir:

On p. 81 of your Feb. 21 issue you said the National Machine Tool Builders' Assn. index of new orders for December was 417. On p. 193 of your Mar. 6 issue you said it was 376.5. Is one of these figures a misprint, and which is right?

R. A. DUFFUS, JR.

Yale & Towne Mfg. Co.
Philadelphia

The monthly index figures released by the National Machine Tool Builders' Assn. (which we reported in our Feb. 21 issue) are subject to revision as late reports straggle in to their statisticians. Usually the preliminary figures and the final ones are within a few points of each other. For December, it happened that late returns changed the index level considerably. The revised figure in the Mar. 6 issue is correct.—Ed.

Sejournet Process

Sir:

On the Newsfront page of your Feb. 21 issue reference is made to the Sejournet extrusion process.

We would appreciate having details of this process, if available, or reference to where they may be obtained.

H. G. WARRINGTON
Technical Director

Dominion Magnesium Ltd.
Toronto

For more information contact Jerome Strauss of Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.—Ed.

O₂ in Steelmaking

Sir:

I would appreciate your advise as to whether there have been any articles during the past year or so on the subject of the use of oxygen in the steel industry.

If so, are the back numbers or tear sheets available?

R. H. LORENTZ

New Rochelle, N. Y.

We have published the following articles on this subject: "Openhearth and Blast Furnace Operators Report Latest Developments," Apr. 27, 1950, p. 84; "Added O₂ Improves Cupola Output," May 4, 1950, p. 96; and "Oxy-natural Gas Hot-tip Heating Increases Ingot Yield," Feb. 14, 1952, p. 126.—Ed.

Gasket Supply

Sir:

On the Newsfront page of your Feb. 28 issue your comment regarding a changed picture on the 5 year supply of gaskets, when they are viewed as a 6 months supply split up among 20 depots, is somewhat puzzling.

Consider the following figures: gasket use per year—assumed 100; average supply—500 (5 years.)

Split the 500 gaskets up among 20 depots and you have 25 gaskets per depot. Split the annual usage of 100 up among 20 depots and we find an average usage of 5 gaskets per depot. It still looks like 5 years supply. Incidentally, even if you measure the average supply per depot against the total annual usage, you still don't get a 6 months supply.

Probably some of your other readers may be interested in your comments.

O. E. MERKT

Drexel Hill, Pa.

We're sorry, instead of 5 years we should have said 10 years.—Ed.

Nitriding Analysis

Sir:

Would you please send us a copy of the article entitled "An Analysis of Nitriding" which appeared in your Feb. 17, 1949, issue. We have been told that this article may be helpful to us in making our knife edge beam centres.

S. M. DIX

Richardson Scale Co.
Clifton, N. J.

SAE Charts

Sir:

We would appreciate three copies of the article "SAE Charts for Heat Treatable Steels" appearing in your Feb. 14 issue.

D. K. FAURSCHOU
Metallurgist

Dept. of Mines & Technical Surveys
Ottawa, Ont.

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ROLL THREADED

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and Small Parts
are Better

Because
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Get

A greater variety of fasteners and small parts that can be made faster, stronger and more economically by Theoll's cold heading and roll threading methods. Cold working of wire stock often surpasses turning, casting, stamping, drawing or molding.

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LOWER DIE COST... Cold-heading dies cost less, even on more intricate sections, than for any other forming operations.

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GREATER TOUGHNESS and FATIGUE RESISTANCE... because grain flow of material is compacted and directed to follow contour of piece.

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Single or multiple secondary operations can be performed on cold headed parts to produce special characteristics required to fit the part for its particular application. Such operations include drilling, tapping, milling, shaving, flattening, notching, flanging, trimming, bending, off-setting, slotting, fluting, swaging, knurling, pointing, heat treating, plating and finishing—all in Theoll's modern plant.

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- ★ Other features: Power indexing; hydraulic feed for milling, drilling and boring; individual lead screw feed for tapping; hardened and ground ways; JIC standard construction; pre-set tools.

Established 1898

THE **CROSS** CO.
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Special MACHINE TOOLS

THE IRON AGE Newsfront

► Extended softness in the steel strip and sheet market is likely to be followed by price concessions from producers now priced above the major suppliers. In the past this usually showed up first in a tendency to forget certain extras. But the Robinson-Patman Act now forces producers to be more careful on price concessions because of the requirement that competitive customers receive equal price treatment.

But there is nothing to prevent them from absorbing freight to meet competition if they choose to do so in individual cases— nothing but some extra work and a fair amount of legal red tape.

► U. S. research is probably four to five times as strong as it was before World War II, a Battelle report indicates. Expenditures were \$2 billion last year—or about 10 times what they were 10 years ago. A further increase is planned for 1952.

► A major effort is under way in Africa to increase production of bort. One mine there has spent \$7.5 million for new equipment and rejuvenation of old machinery. An increase in industrial diamond shipments to the U. S. can be expected this year from these mines.

► Rising prices have forced big additions to appropriations set aside for steel plant expansion. U. S. Steel alone had to put an extra \$67 million into the kitty (or more than 10 pct) to cover completion of planned projects.

► Independent automobile manufacturers are a little worried about their market in the second half of the year. If allowable production quotas are substantially raised then, some production might start setting new highs for the year at a time when sales resistance is also highest. A soft market then will be hard on the independents.

► Some automobile men now feel that the copper shortage will not be a drawback to increased production during the rest of the year. Because of copper producers' concern over increasing tests of substitutes they feel sure that steps will be taken to get them the copper they need. Also, there is still strong resistance in the industry to some suggested substitutes.

► Recent announcement that an order had been placed for a Sendzimir planetary hot rolling steel mill publicizes a project that has been under wraps for several years. This single stand mill reduces a slab from 2-1/4 to 1/8 in. in a single pass. The first of these mills has been tested by two steel companies and is now running satisfactorily in a midwestern steel plant.

► An internal motor with a speed of 70,000 rpm is being used by the Navy to study free flight of projectiles. Models are spun in a high speed wind tunnel to study effects of centrifugal force, surface friction and drag.

► A British firm has set up a special shop for retired employees, whose average age is 75. The main plant schedules light machining and assembly work to the shop, which operates profitably, efficiently and without trouble.

► Formation of sludge and scale in caustic treatment of aluminum has been virtually eliminated in a large refrigerator plant through use of a new caustic etching product. More consistent finishes are secured too.



Need Welding Help?

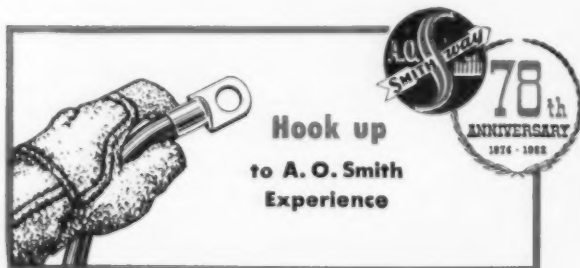
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COKE: Is Shortage Possible In Mid-1953?

Defense Solid Fuels Administration thinks so despite record oven construction in '52 . . . Overage ovens can be driven to shutdown, gas competition drops coke output—By J. B. Delaney.

This will be a record year for construction of coke ovens. The expanding steel industry needs more pig iron to charge in its open-hearth and coke is a basic ingredient of iron. Defense Solid Fuels Administration is jittery. It believes that a coke shortage in mid-1953 is possible.

Uneasiness is motivated by the large number of overage ovens which are now producing at top rates. This forced service over long periods of time could lead to forced shutdown. Wiping out that margin of safety would contribute to a shortage. Increasing availability of natural gas, principally on the East Coast, is also forcing some public utility companies to abandon coke ovens. The manufactured gas produced is non-competitive with natural gas.

DSFA admits the coke outlook could be changed by a decline in steel demand or a better and cheaper supply of scrap. But these are only possibilities, and have no place in a long-range defense program that could become critical overnight.

Most Ambitious—The construction program for 1952 is the

most ambitious in the industry's history. It calls for completion of 1155 slot-type ovens, 192 of which result from reconstruction, and 264 beehive ovens. This will result in a net gain of only 2,900,000 tons due to other ovens going out of operation for reconstruction. Some of this may spill over into the first quarter of 1953. Coke production may reach a new high of over 81 million tons in '52, including about 7.5 million tons of beehive.

Coke capacity planners had originally expected a deficiency to show up this year, but new furnace capacity has not come in as fast as they had anticipated. This saved the day in their estimation

although they consider their own program to be behind schedule, largely due to limited supply of coke-oven brick.

DSFA expects coke production to reach a rate of 83 million tons annually by July 1953. By that time, too, steel capacity is likely to have risen to the current goal of 120 million tons, barring unforeseen developments. Coke demand would be at an all-time high.

Ills of Old Age—Overage ovens are a real worry. Approximately 42 pct of existing units have been in operation beyond their life expectancy of 25 years. Only ingenuity and stop-gap repairs are keeping them in production. Even so, DSFA looks for a production loss of between 3 and 3.5 million tons per year due to obsolescence unless reconstruction is stepped up.

Chas. W. Connor, DSFA Administrator, points out that in both 1949 and 1950, coke capacity dropped because retirement of overage ovens exceeded installations. Last year, when 696 ovens were installed, production was increased by 1.3 million tons. But only 144 of these ovens were new; the balance represented reconstruction. Some 335 ovens retired.

As of last Dec. 31, approximately 15,343 slot-type ovens with a rated annual capacity of 75,060,-

COKE OVENS FOR 1952
Chemical Recovery Type

Company	Est. Rated Capacity (Annual Net Tons) New Ovens	Est. Rated Capacity (Annual Net Tons) Reconstructed Ovens
Armco Steel Corp., Middletown, Ohio	446,000	
American Steel & Wire Div., Duluth, Minn.		134,000
Bethlehem Steel Co., Johnstown, Pa.		461,000
Bethlehem Steel Co., Lockawanna, N. Y.	463,000	
Bethlehem Steel Co., Sparrows Point	410,000	305,000
Crucible Steel Co., Midland, Pa.	118,000	
Ford Motor Co., Rouge, Mich.	205,000	
Granite City Steel Co., Granite City, Ill.	133,000	
Great Lakes Carbon Corp., St. Louis	132,000	
Interlake Iron Co., Erie, Pa.		135,000
Pittsburgh Coke & Chemical Co., Neville Island, Pa.	237,000	
Republic Steel Corp., Cleveland	783,000	
Republic Steel Corp., Birmingham	356,000	
Sloss-Sheffield Steel & Iron Co., Birmingham	146,000	
United States Steel Co., Morrisville, Pa.	953,000	
Wheeling Steel Corp., E. Steubenville, W. Va.	405,000	
Wisconsin Steel Co., S. Chicago	80,300	
Woodward Iron Co., Woodward, Ala.	125,000	
Youngstown Sheet & Tube Co., Indiana Harbor, Ind.	480,000	
TOTAL	5,492,500	1,035,000

ORE BOATS: Shippers Watch Weather

Iron ore shippers are anxious to get cargoes moving . . . Given an early break in the weather, shipping could start by next week . . . Pressure not so great this year—By E. C. Beaudet.

Iron ore shippers were anxiously watching the weather this week hoping for an early break in the ore shipping season. In view of the expanding fleet capacity, shippers should be able to break the peacetime record lake movement of 89,092,012 gross tons set in 1951, provided they are not hampered by an unfavorable turn in the weather or slipping demand. A total movement of 90 to 95 million tons is expected in 1952.

There are doubts that the all-time record movement of 96,998,943 tons, including rail shipments, in 1951 will be broken. There was no doubt about the strength of the steel market at the beginning of last year. However, the possibility of an easing off of the market may result in a lower movement of ore. Another factor that may work against a higher movement is the possibility of a steel strike.

Less Pressure—Furthermore, pressure for ore this year is not as great as it was during 1951. Stock piles of ore on hand at furnaces and Lake Erie docks are

in a healthier condition. As of Mar. 1 they are estimated at 28,470,000 tons. If consumption this month reaches 7.5 million tons, stocks on hand Apr. 1 will total approximately 21 million tons. This compares with 16,800,000 tons at the same time last year.

Navigation on the Great Lakes is expected to reach full scale about the first week in April. U. S. Weather Bureau reports Lake Superior and Green Bay ports may be open as early as Apr. 3. However, last week below-normal March temperatures were reported with several below-zero readings in northern waters. Even without warm March temperatures, the Weather Bureau expects shipping should get under way earlier than usual.

More Boats—This year one of the greatest expansions in the history of the fleet will take place. Trip capacity at the start of the season stands at 2,672,000 tons with the number of boats at 270. Ten more will be added during the season. However, the increase will be more than expected by the

numerical addition of new boats. The new ships average around 19,000 tons capacity compared with an average of about 10,500 tons per ship operating on the lakes last year. By the end of the season the expansion in trip capacity is expected to be in the neighborhood of 200,000 tons. Some sources claim new capacity will make possible the movement of an additional 7.2 million tons during 1952.

In addition to the U. S. boats, the Canadian fleet is once more expected to help out in the ore movement. The 42-vessel Canadian fleet has a total trip capacity of 360,900 tons. Four more Canadian vessels will be added during the shipping season. Legislation permitting the use of Canadian boats has already been introduced in Congress and is expected to be passed with little difficulty.

In view of the increasing capacity of the fleet, all rail movement of ore is expected to fall below the record of 7,535,217 tons carried in 1951. Higher costs and the possibility of some slackening of the pressure for ore will in all likelihood reduce this total.

Less Rail Movement—The increased fleet capacity and more will be needed in future years when use of taconite reaches a large scale. Taconite programs

Special Report

Continued

000 tons were active. This compared with 14,982 ovens with a capacity of 72,488,200 as of Dec. 31, 1950.

Deadly Competition—Natural gas, which is cheaper on a btu basis than manufactured gas, has already proved costly in terms of coke capacity and will make further inroads within the next year. Since 1941, utility companies have abandoned 289 ovens due to inability to compete with natural gas. Within the next few years five additional companies with a capacity

to produce 1,811,000 tons of coke per year may drop out of the business for the same reason.

These latter companies and their capacities are Rochester Gas & Electric Co., Rochester, N. Y., 170,000 tons; Brooklyn Union Gas Co., Brooklyn, N. Y., 607,000 tons; Consolidated Edison Co., Hunts Point, N. Y., 602,000 tons; Providence Gas & Electric Co., Providence, R. I., 250,000 tons, and Indiana Gas & Chemical Co., Terre Haute, Ind., 182,000 tons.

Inability of coal-chemical recov-

ery ovens to fulfill demand for coke has meant continued reliance on beehive ovens which do not produce valuable coal chemicals. Of the 79,123,000 tons produced last year, 7,340,000 tons were beehive. As of last October, 11,759 of 13,589 useable beehives in Western Pennsylvania and Northern West Virginia were operating. Record beehive production of 8.2 million tons was attained in 1942.

Lucerne Coke Co., Indiana, Pa., will complete construction of 264 new beehives this summer.

Raw Materials

now under way will demand well in excess of 10 million tons of taconite ore each year which will impose a heavy burden on the fleet. So far taconite movement has been relatively minor, reaching a total of 131,000 tons last year. However, it has been steadily increasing and is expected to be higher in 1952.

New Army Specs Conserve Metals

Before the end of March, the Army predicts, more than 5 million lb of copper will have been saved this year by the use of steel in manufacturing small arms ammunition.

Substitution of a clad steel jacket for one of copper-zinc alloy enabled the Army to conserve 3,675,587 lb of copper during the final quarter of 1951.

Manufacturers also have been eliminating copper from many small items such as snaps, springs, buckles, and locks. They have utilized plated steel in such production.

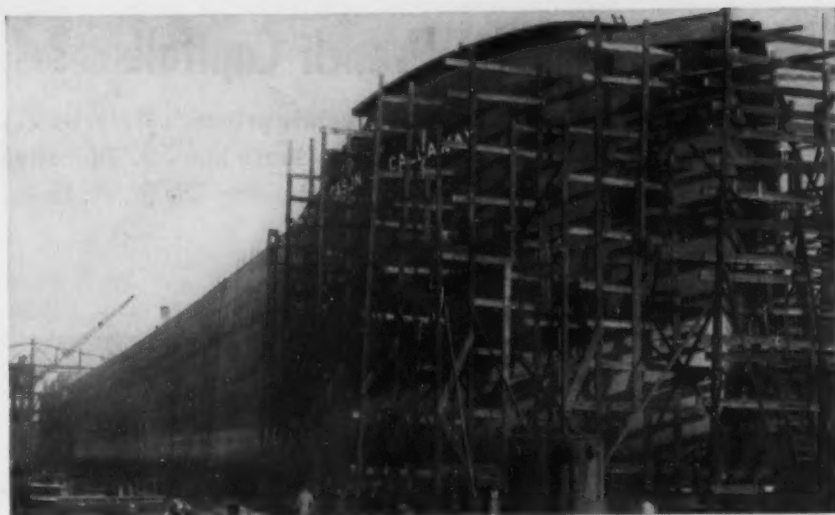
The Army has altered specifications for guns, incendiary bombs, weapon mounts, medical service items, radio sets, hospital beds, and even harbor tugs in order to save short-supply metals. Boron and lead alloy steel are now called for in the manufacture of guns, gun mounts, and tank and truck parts.

Total savings in three fields, from last Oct. 1 to April 1, are expected to be: copper—10,642,092 lb; zinc—598,401 lb; and nickel—601,973 lb.

Extra Quota Materials Available

Enough controlled materials now have been earmarked for the "small business hardship account" to cover the screened requirements of all small manufacturers who had been facing shutdowns but who submitted their applications before the Mar. 13 deadline, according to Administrator Henry H. Fowler of National Production Authority.

Late applicants who got their requirements in after that date are likely to get less than they need.



GETTING SET: Work is speeded on the *Cason J. Callaway* at the River Rouge yards of Great Lakes Engineering Works to ready U. S. Steel's newest ore boat for the coming shipping season.

About 140 small firms beat the deadline.

Fowler says some 42,000 tons of carbon steel have been earmarked for an automatic 10 pct increase (of first quarter allotments) to manufacturers of specified civilian type goods.

Additional categories have been added to the original list of products which will be allowed the bonus allotments, provided no extra allocations of aluminum and copper also are needed. These include: Safes and vaults, morticians' goods, motorcycles and bicycles, highway signs, etc.

No Boost in Diamond Stocks Seen

Present indications are that there will be no measurable increase in the near future in the industrial diamond supply—most of which must be imported—but consumption is rising to a new peak.

This is the primary reason for the salvage program worked out by National Production Authority and the industrial diamond industry. The program was announced this week at the Chicago convention of the American Society of Tool Engineers.

NPA last week issued a new order, M-103, placing restrictions on users and manufacturers of diamond grinding wheels.

Main features of the order are: Limitation of grinding wheel inventories to 60 days, beginning May 13; that users confine use to the most durable type wheel for grinding certain types of carbide tools; and limitation of bort content and depth of bearing service.

Salvage details are given in a booklet which is being made available at all Commerce Dept. field offices.

Pointing out that about one-half of all diamond bort is salvageable for incorporation into grinding wheels, the booklet urges wet grinding wherever possible, precision mounting of diamond wheels, and strict conformance to rated grinding speeds.

Heart of the salvage program is the appointment of one official to be responsible for salvage and conservation and the immediate inspection and turn-in of worn-out, broken or obsolete diamond grinding wheels and tools for salvage.

More Iron Ore Found in Alabama

Announcement of discovery of iron ore deposits in southwestern Talladega County, Alabama, has been made by Hugh D. Pallister, senior geologist of the Alabama Geological Survey. He said it is the highest grade ore found in Alabama, from 40 to 50 pct iron.

EDUCATION: Why Preach Capitalism?

Worker should be taught to appreciate private enterprise . . . Management should be equipped to teach him . . . Education programs must be fitted to individual plants—By W. W. Taylor.

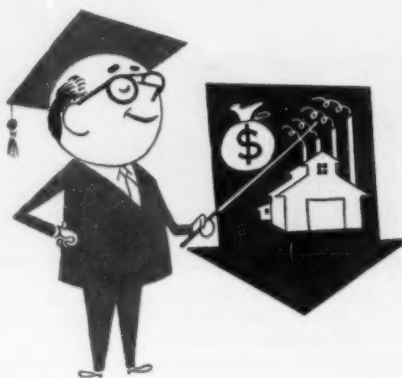
Management can best defend the private enterprise system through what are known as "educational programs." These are changing from the pattern nonchalantly tossed off by company publicity men to sincere and logical preachments for capitalism.

Management is more willing to talk and the production worker is showing himself more willing to listen. The idea is being proven in industry that worker education pays off. But before management can do this sincerely and logically, it must be educated to the need for these down-to-earth programs. Industry can best achieve success when these programs start at the top.

Col. John Slezak, president of the Turner Brass Works has spotlighted the importance of employee motivation programs when he claimed that ". . . in the total cost of the national product and services the cost of labor amounts to approximately 75-80 pct." If labor is to represent such a high cost, it should be more carefully chosen and then educated in company and free enterprise principles. But also the worker must, through education, be given the incentive to seek further production and social gains.

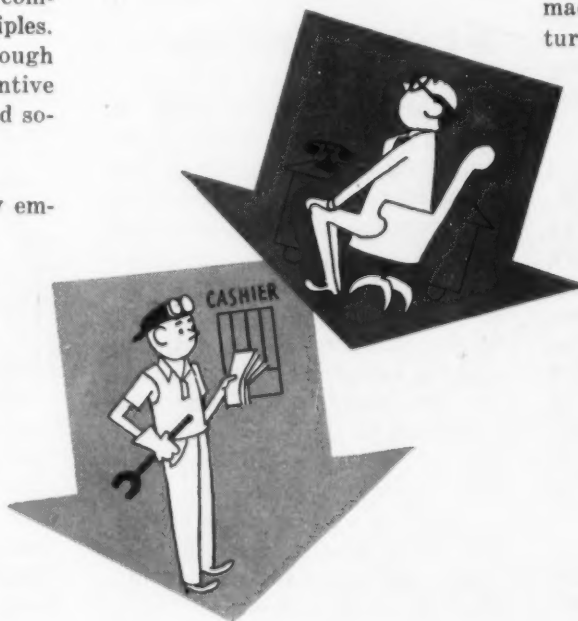
Constant Attention—A new employee requires "break-in" periods but additional attention must be given if he is to become a cooperative member of the "team." He will have greater respect for the "boss" and company whose responsibilities he understands. This requires a continuing program.

Through company papers and "house organs," news of the worker's social life



and company news is treated, creating a feeling of unity. Other mediums of "talking to" labor are: personalized mimeographed letters on major issues and company policies; distribution of pamphlets or bulletins covering wise budget planning in its many phases; more active, respected community relationships; and courses giving the worker the opportunity to advance up the line.

One of the most important and widespread programs is economic education.



Republic Steel Corp. offered such an economic course and developed interest by first approaching it from the personal standpoint, acquainting the worker with fundamentals such as, income budgeting, mortgage plans, taxes, etc.

Conducted in conjunction with the Industrial Relations Center of the University of Chicago, scientific "before-and-after" tests proved that 3000 supervisory members completing the course had broadened their knowledge of economics as well as personal opinions. These men, on the front line of management, not only better understood free enterprise but were better equipped and willing to sell it.

Need Executive Training—In a report issued by Columbia University, after an exhaustive survey, several important facts relating to needs for in-plant education were revealed. Of these the most important was said to be the recognized need for management development through executive training. However, comparatively few firms are doing anything concrete to prepare supervisory or junior executive personnel for top level responsibilities.

Need for executive education is made more apparent by the huge turnover of executives, a greater need for executives to manage expanding programs and the fact that older management must continue to bear the brunt of leadership because of the lack of training among junior executive groups.

Management surveys have shown that foremen should be made part of the management group. This makes foremen feel they are full-fledged members of management. It also helps to keep the job of foremen attractive to desirable men anxious to train for promotion.

No longer can management be considered a haphazard proposition. It has become a science. There's no room for half-hearted interest to the opinions of the millions who man the factories. These men can be valuable allies in politics and productivity if the issues are made clear.

In a recent address, delivered before the American Management Assn., Thomas R. Reid of Ford Motor Co., claimed that because of "... the failure of American workers generally to understand the principles upon which free enterprise rests, many business leaders see reasons for great concern."

Proven Results—Following comprehensive educational courses at every level, results have indicated improved labor relations, productions, safety, materials control and economics. They have also shown an increase in initiative, planning ability, interest and appearance.

However, employees must be convinced of management's sincerity in their welfare, otherwise, they may suspect selfish motives and view educational programs with skepticism.

Unfortunately, programs can not be successfully "packaged" for general use. They must be tailored scientifically to the needs of the company. Furthermore, they all involve time, effort, sincerity, and money.

Management generally, is always under criticism by those who believe they could do a better job. Proper educational programs can help to correct this thinking. Because of its importance, management must be ready to meet the challenge and develop its employee relations.

Republic Miners Choose UMMSW

By the slim margin of 14 votes red ore miners of the Republic Steel Corporation in the Birmingham area voted to retain the International Union of Mine, Mill & Smelter Workers as their bargaining agent at a National Labor Relations Board election.

STEEL: Sure to Lose Some Production

Bank furnaces, coke ovens in case union snubs WSB's plea to delay strike to Apr. 8 . . . Industry can't take chances . . . Mood of workers uglier . . . Basic issues unchanged—By J. B. Delaney.

The steel industry laid plans this week to protect its equipment from damage in case the United Steelworkers did not agree to postponing the strike they had threatened for Sunday, Mar. 23. Banking furnaces and coke ovens was the slow-down prelude in anticipation of shutdown and it meant loss of some steel production—irretrievably.

Producers undertook these preparations because they had no way of forejudging results of the union's Wage Policy Committee's Washington meetings on whether or not to agree to Wage Stabilization Board's request for a strike delay till Apr. 8. Some mills were planning to start curtailment of operations as early as Wednesday of this week—others the next day.

The industry could take no chances on the mood of the workers. Decision of the Wage Policy Committee was not expected until Thursday or Friday. This left too little time to get in shape for shutdown if the voting went wrong.

Ugly Mood—There have been increasing signs of worker discontent and bitterness over the 4-month delay of the wage settlement. Local steel unions were girding for a strike and some local leaders have been talking of refusing to provide maintenance men for struck plants—a throwback to the stormiest days

of union-industry relations. On the other hand, WSB had asked the union to agree to a 4-day advance strike warning.

Union chest-thumping and WSB stalling do not alter the fundamental issues of the wage-price dispute one iota. The facts still stand that the industry is against both a pay rise and a price rise as injurious to the economy. And if WSB recommends a substantial wage hike for the union, then the industry must have a balancing price rise.

If the price rise is not enough to assure the financial stability of the steel companies, it will be rejected. Should WSB grant an increase of 15¢ an hr, the industry will probably want at least a \$6 a ton price increase. If WSB recommends 18½¢ an hr, it would take a price rise of more than \$7 a ton to balance direct and indirect costs.

No Commitment—At press time, Phillip Murray had refused to give any commitment on whether or not he would agree to WSB's request for a strike postponement. It was to be left to the Wage Policy Committee meeting on Thursday. What the union's tactics of impatience could gain for it was forcing WSB to make public its findings before the committee met.

If they were favorable, the union then would have nothing to gain by jumping the gun on a strike. It had agreed to too great a delay already to lose out on the last lap.

WSB had made it known that it had the means to recommend a wage boost of from 9¢ to 23¢. On the other hand, at press time, Office of Price Stabilization was acting as if it had never heard of the WSB or the steel dispute and testing producers on whether or not they would accept a Capehart Amendment cost adjustment (to July only) of from \$2 to \$3 a ton.



He's on piecework.

RAILROADS: Union Fights Military

N. Y. Central strike held to be first thrust against Army control . . . Legal strategists map full-scale offensives . . . First operations deliberately limited—By K. W. Bennett.

On stage was the New York Central Railroad strike, which tied up NYC lines between Buffalo and Chicago last week. Offstage, railway labor leaders were planning this as the dress rehearsal for something bigger.

The Army is nominal operator of the nation's railroads since a Federal seizure order in 1950. This would make it difficult to call a

cator of their caution in the west: the Indiana Harbor Belt RR, which does most of NYC freight switching in Chicago and could tie up a number of other lines if struck, was untouched. This, although it is a NYC subsidiary.

The concurrent St. Louis Terminal strike, like the NYC strike, was fairly well localized.

If the strike had brought no in-



TIED UP: New York Central passenger trains were idled by the recent strike at Chicago's South Side Yards. Two of the line's crack trains, The New England States (second from left), and The Pacemaker (right foreground) were among those held up.

strike without the government stepping in. The government would call for an injunction with the argument that the strike was a danger to national defense. Labor leaders moved carefully in planning the extent of their move. Forming a single front, heads of the Brotherhoods of Firemen, Conductors and Engineers jointly called their strike against NYC.

West of Buffalo—Picking this single road, they struck only west of Buffalo, NYC division point, leaving East Coast traffic relatively undisturbed. The paralysis moved as far west as Chicago, and stopped there. A significant indi-

junction, IRON AGE informants believed it would have triggered other localized strikes affecting single roads. There is already a precedent—the Atlanta Joint Terminal strike one month ago.

Arguments—While they weighed the chances, railway brotherhood leaders were figuring a second possibility. If the injunction was declared—and so it came about—they would attack the legality of the government seizure of the railroads. It appears that this is what is happening. When the case is hailed before Federal Judge Emerich B. Freed at Cleveland on March 21, labor arguments will be:

(1) Government seizure of the railroads is not lawful, but, if it is, then

(2) There are other remedies available. These would include naming of an Emergency Board under the Railway Labor Act; or

(3) Application of the Taft-Hartley Act, if railroad employees can be considered government employees. And,

(4) If they are under the direction of the Army, then the Army has remedies for individual disciplining of employees. If these arguments seem weak, labor attorneys will return for ammunition to the localized nature of the strike and aver that the shutoff of only two railroads did not impair the transport system of the nation.

As of last week, labor seemed determined to carry the battle through the courts. If they win their case, government control of the railroads under a legal precedent dating back to 1916, would be knocked out of the picture.

Sidelights—Strike leaders had some difficulty in calling their forces back to work. Toledo, and Elkhart, Ind., groups threatened to remain out unless they had assurance that the strike demands would be met.

In Saline County, Ill., over 20 coal mines were shut down as NYC freight service halted.

From its beginning at 8 a. m. Sunday, the strike had idled about 30,000 NYC employees before it drew to a troubled close Tuesday, March 11. By Thursday of last week, had the strike continued, 50,000 NYC employees would have been off their jobs.

Loss to NYC was estimated at \$1 million per day. At Chicago, an average of 50 freight trains per day that NYC would have moved—were on the sidings.

Build 194 Cargo Barges

Three shipyards designated as small-business concerns will build 194 deck cargo barges ordered by the Army through Navy Bureau of Ships under terms of contracts totaling \$3,571,000.

Iron Ore:

Railroad will start hauling from Labrador-Quebec field by 1954.

The railroad from the ore fields of Labrador-Quebec may be hauling iron ore to Seven Islands by the summer of 1954 instead of 1955, as originally planned. This was admitted by Jules R. Timmins, president of Labrador Mining & Exploration Co., Ltd.

Railroad construction is on schedule. About 2500 men were on the job this winter. Construction men expect to complete 190 miles of track laying this year.

While no new ore has been added to the reserves because the search was discontinued to concentrate on development of known reserves of ore, one new high grade deposit was discovered by one of the geological mapping parties.

The combined reserves of Hollinger North Shore Exploration Co., and Labrador Mining and Exploration Co., total 417,707,000 tons. This is divided into three categories, 227,908,000 tons of bessemer; 136,433,000 tons of non-bessemer and 53,366,000 tons of manganiferous ore.

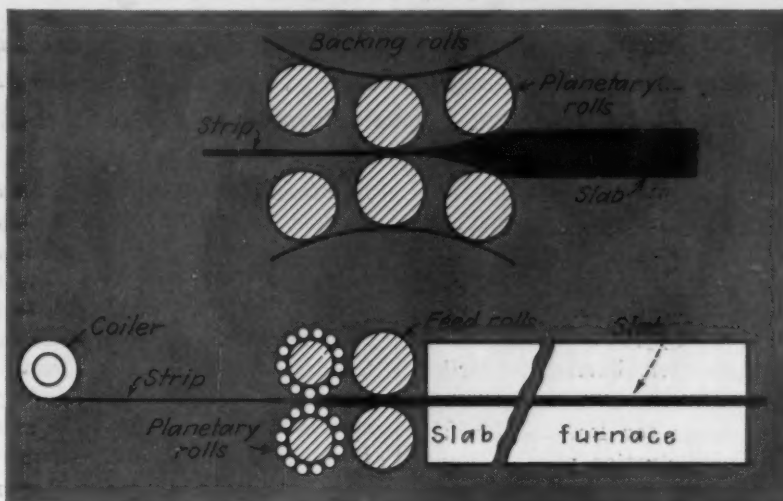
Mr. Timmins said that probably the first deposits to be mined would be the Ferriman Nos. 3 and 5 ore bodies. These contain about 88 million tons of ore.

Nicar Nickel in IMC Quotas

Nickel from the recently-reactivated Nicaro Mines in Cuba is included in the International Materials Conference allocation of 33,583 metric tons of nickel to 36 political regions in the current calendar quarter.

The U. S. is scheduled to get 22,951 tons, followed by United Kingdom with 5,170 tons. Materials being distributed include all marketable forms of primary nickel, but exclude nickel salts.

Production is far from meeting requirements, IMC says. The agency expects to gather material on the steps participating countries are taking to conserve both nickel and cobalt.



Canadian Firm Orders Sendzimir Mills

Two Sendzimir strip mills will be combined in a new installation at Atlas Steels, Ltd., Welland, Ont. A 19-in. planetary hot mill will be combined with a cold reduction mill for an estimated annual stainless strip production of 8000 tons. New facilities are expected to be in operation in 1½ years.

The hot strip mill will be the second Sendzimir installed for commercial production in this hemisphere. One commercial unit and two non-commercial are now operating in this country. Another commercial unit is on order for installation in England.

Specially conditioned slabs, 2¼ in. thick, will enter the hot mill through a high head furnace and will be rolled in one pass to ⅝-in. bands in coils of 4000 lb. Heavy reductions possible on the cold mill will greatly simplify intermediate annealing and descaling lines. A 2-high temper mill will complete the processing except for slitting, leveling, shearing, etc. The two Sendzimir mills will be built in Canada by John Bertram Co., in collaboration with Armzen Co.



Strip facilities have been financed by the sale of over \$6 million worth of bonds and debentures. Atlas is also planning a welded tube mill. Part of the production of both units is slated for the firm's export markets.

Increased home demand and continuing expansion of Canadian industry also promises a strong market.

STEEL: Washington Isn't Listening

DPA as yet has no specific decontrol machinery . . . Developing an approach, Congress told . . . Planners see no need to drop curbs now . . . "Complex problem"—By A. K. Rannels.

Industry's warning that retention of steel controls is endangering vital production is apparently falling on deaf ears at government control agencies. Carbon steel decontrol is being considered for the fourth quarter, barring a strike, said DPA's Manly Fleischmann.

Spokesmen for Defense Production Administration went to Capitol Hill last week to answer steel-supply questions. They indicated that no specific decontrol machinery has yet been established. They based their inaction on arguments that decontrol was not needed.

DPA is developing an "approach" to decontrol problems, the House Small Business Committee was told, which is to be "satisfactory" to everybody. That remains to be seen. The agency feels that it would be "premature to decontrol now"—except, perhaps, secondary steel products, used steel, conversion steel, and merchant products.

The agency is aware that this is a sore point with steel people, who

feel that controls should be lifted, product by product, as market conditions warrant—as was promised.

But, as the DPA experts explain it, it is not that simple. It is "a complex problem." They maintain that since allotments are made in broad categories, decontrol of specific products in easy supply would seriously affect other products in tight supply.

"Decontrol of carbon steel sheet, for example," Assistant DPA Administrator W. C. Truppner said, "would result in use of carbon steel allotment authority for placement of orders on bars, or tubing, or some other tight product in a volume for which no provision has been made."

Officials are not yet ready to concede that the softening market is anything more than temporary in nature. They feel that the current "apparent easiness at the mill level" is not sufficient to cause undue concern. Their own reports indicate that mill books for April are full and they say that May-June open

space is "now in the process of review."

In support of DPA's stand, the curtain is lifted to give an advance peek at the third quarter. Preliminary requirements as now projected by the claimant agencies, compared with estimated supplies, are seen as follows:

Stainless steel, 212 pct; structural steel, 151 pct; steel plate, 145 pct; carbon steel, 136 pct; and alloy steel, 128 pct.

Requirements for copper and brass mill products and copper foundry products are now seen as exceeding supply by 40-45 pct. Aluminum demands for third quarter are estimated as being one-fourth more than production.

Meanwhile DPA says, it is taking the following steps:

Liberalizing the self-authorization schedules as materials get more plentiful; considering a form of open end operation of CMP, considerably different from that of last year; improving the operation of directives by permitting an unfilled order to move into the next quarter with a higher rating; and, preparing to issue more flexible inventory regulations (see page 69).

Industry Controls This Week

Cadmium—Use controls relaxed by amendment of M-19. Inventory controls retained.

Diamonds — M-103 places restrictions on use and inventories of diamond grinding wheels.

Ferroalloys—Amended M-80 establishes simplified allocating procedures for specified alloying materials.

Rubber—Export markups of 3 pct for carload lots and 3½ pct for l.c.l. lots of GR-S type rubber over domestic ceiling prices are allowed by SR 2, CPR 61. SR 2 also permits addition of delivery costs of \$1 per cwt in carload lots and \$1.60 for l.c.l. lots to export ceilings.

Tinplate—Canmakers have received an extra allotment of 103,000 tons of tin mill plate for first half of 1952 by amendment of M-25.

Zinc—Amendment of M-9 permits quarterly as well as monthly allocation of this metal. M-9 now consolidates all existing zinc orders with revocation of M-15 and M-37.

STEEL: Output of Ingots, Castings Up in February

As Reported to the American Iron & Steel Institute

	Openhearth		Bessemer		Electric		Total		Calculated Net Tons	No. Weeks in Month
	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.		
1951										
January	7,844,982	101.4	431,725	90.4	566,460	88.3	8,843,167	99.9	1,996,200	4.43
February	6,935,512	99.3	326,112	75.6	504,077	87.0	7,765,701	97.1	1,941,425	4.00
March	8,059,625	104.2	408,926	85.6	602,504	93.9	9,071,055	102.4	2,047,642	4.43
1st Quarter	22,840,119	101.7	1,166,763	84.2	1,673,041	89.8	25,679,923	99.9	1,996,884	12.86
April	7,857,161	104.9	392,472	84.9	590,888	95.1	8,840,521	103.1	2,080,728	4.29
May	8,071,270	104.3	408,650	85.6	614,579	95.7	9,094,499	102.7	2,052,934	4.43
June	7,667,811	102.3	403,001	87.1	586,148	94.3	8,656,960	100.9	2,017,939	4.29
2nd Quarter	23,596,242	103.9	1,204,123	85.9	1,791,615	95.0	26,591,980	102.2	2,043,965	13.01
1st 6 Months	48,436,361	102.8	2,370,886	85.0	3,464,656	92.4	52,271,903	101.1	2,020,561	25.67
July	7,704,433	99.8	411,599	86.4	563,215	87.9	8,679,247	98.2	1,963,631	4.42
August	7,693,322	99.4	436,822	91.5	503,448	94.0	8,733,592	98.6	1,971,465	4.43
September	7,652,167	102.4	404,726	87.7	595,004	96.4	8,651,897	101.2	2,022,172	4.28
3rd Quarter	23,049,922	100.5	1,253,147	88.5	1,764,667	92.8	26,067,736	99.3	1,986,357	13.13
9 Months	69,486,283	102.0	3,624,033	86.2	5,229,323	92.5	78,339,639	100.5	2,067,709	39.00
October	8,027,006	103.8	458,128	95.9	631,000	98.3	9,116,134	102.9	2,057,816	4.43
November	7,749,190	103.4	411,954	89.1	632,507	101.6	8,793,651	102.5	2,049,802	4.29
December	7,884,146	102.1	396,831	83.3	604,152	94.3	8,885,129	100.6	2,010,210	4.42
4th Quarter	23,660,342	103.1	1,268,813	89.4	1,867,659	98.1	26,794,814	102.0	2,039,167	13.14
2nd 6 Months	46,710,294	101.8	2,520,060	89.0	3,632,326	95.4	52,862,650	100.7	2,012,282	26.27
Total	93,146,825	102.3	4,890,946	87.0	7,096,982	93.9	105,134,553	100.9	2,016,390	82.14
1952										
January ¹	8,102,985	100.7	407,298	89.3	625,834	89.7	9,136,117	99.3	2,062,329	4.43
February ²	7,888,000	102.2	383,000	89.9	574,000	88.0	8,845,000	100.8	2,088,000	4.14

Note—Percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons openhearth, 107,806 net tons bessemer and 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951 as follows: Openhearth 91,054,020 net tons, bessemer 5,821,000 net tons, electric 7,554,630 net tons, total 104,429,650 net tons. Percentages for 1952 are calculated on weekly capacities of 1,816,837 net tons openhearth, 102,826 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952 as follows: Openhearth 94,973,780 net tons, bessemer 5,381,000 net tons, electric 8,232,890 net tons, total 108,587,670 net tons.

¹ Revised.

² Preliminary figures, subject to revision.



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Keep conductor cords of hoists, portable tools, or mobile devices, having motors up to and including 1 H.P., taut and up out of the way.



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HOISTS**

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Builders of "Shaw-Box" Cranes, 'Budgit' and Load Lifter Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, and 'American' Industrial Instruments.

Controls

Relax Control of Cadmium Use

National Production Authority last week relaxed use controls of cadmium by amending M-19. Inventory controls are retained, however.

Unrestricted use in items or processes included in the permitted list is now allowed. In addition, the list of cadmium plated items has been expanded.

There will be no restriction on use for orders bearing the A-to-E and Z-2 ratings.

For all other items actually produced during first half 1950, a monthly use of 70 pct use will be permitted.

Helping Get Forging Bars

Munitions Board assistance will be given manufacturers of chain and rope fittings in placing orders for controlled materials needed for defense orders.

This industry has reported that it is able to place no more than average of 60 pct of first quarter allotments of carbon steel forging bars. It is falling behind on defense orders.

As a result, National Production Authority has been told, the industry's backlog of orders for fittings has increased by about 67 pct.

Latest Government Appointments

Washington has recently announced the following appointments in defense and related agencies:

W. W. Day, director, Communications Equipment Div., NPA;

LEAKE Created* Metal Stampings

***RESEARCH • DESIGN
ENGINEERING • PRODUCTION**

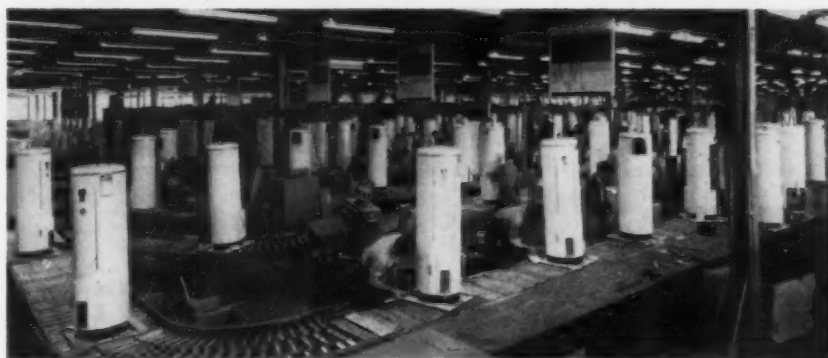
**Unusual: More than 70%
of our customers have
their own stamping
press department!**

**THE LEAKE STAMPING CO.
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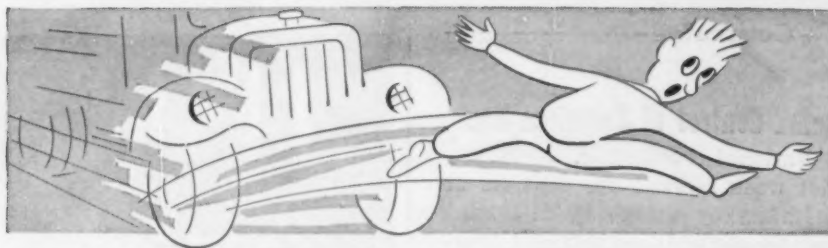
Roy W. Ewertz, director, Ordnance & Shipbuilding Div., NPA;
Ray W. Ireland, acting administrator, Defense Air Transportation Administration;

Nathaniel Knowles, vice-chairman in charge of stockpile programming, Munitions Board, Defense Dept.;

Everett Prechel, Army member, Chicago Regional Renegotiation Board.



MORE PRODUCTION: Assembly lines at A. O. Smith's Kankakee Works, Kankakee, Ill. A recently-instituted replacement program is expected to double the plant's capacity for glass-lined domestic water heaters.



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of your
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Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"

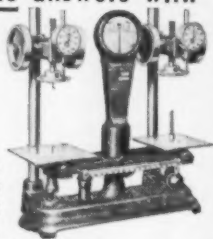


MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 1 9/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

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Controls

New Defense Bottleneck Plan Set

Greater speed in clearing log jams which block delivery of urgently-needed military items may be achieved by a new procedure worked out by the Defense Dept. and National Production Authority.

Under this plan, a manufacturer of important defense materials may appeal directly to NPA if the military agency working to break the production bottleneck in his plant has not succeeded in 5 days. Officials expect use of this special-assistance request only when a few specialized end-items, specified by the Defense Secretary, are involved.

The manufacturer will continue to have primary responsibility for solving production problems in his own plant. If he is unsuccessful, he will ask the military representative for his plant to give assistance. When the latter has pinpointed the cause of the trouble, he will report the situation to the designated military field agency.

Can Makers Get More Tinplate

Allotment of 103,000 tons of secondary tin mill plate to can manufacturers for use during first-half 1952 in addition to percentage quotas has been made official by National Production Authority.

Some 35,000 tons were made available for use during the remainder of the first quarter with the remainder set aside for second quarter use.

Action was taken by amendment of M-25. Restrictions on quality of prime plate and set commodity percentage quotas are retained.

Lead Users May Draw Advance

National Production Authority has notified lead consumers that they may draw against advance allocations for April and May if they need more lead to meet production schedules than was allocated to them in March.

March allocations totaled 70,000 tons. Advance allocations permitted are 95 pct of March allotments for April and 90 pct for May.

Production

German Tools:

Eager to sell to U. S. . . . Importer sees tool sales as increasing.

Postwar competition of European machine tools has been more successful within the American market than it has ever been. The U. S. is now an important "dollar" market for Europeans.

U. S. manufacturers have turned to Germany, among other European countries, for machine tools. For instance, Kurt Orban, a New York importer, reported last week that in the past 6 months he has delivered \$600,000 worth of tools to American customers. He thinks the buying trend is on the upsurge.

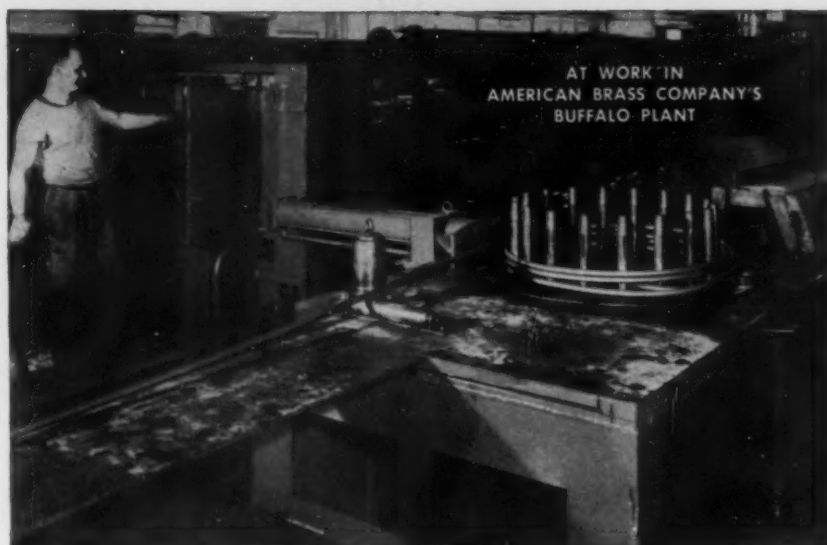
Advantages German tool makers enjoy over American producers are shorter delivery times, about 6 months, and lower prices. German tool builders are also seeking to protect their new-found market by setting up servicing facilities for their tools in this country. One is in Cleveland, where non-standard parts are stocked.

Defy the Reds—The Germans, says Orban, have been stressing quality to crack the U. S. market. As new plants are set up in the western zone, workers are sneaking back across the Russian lines to take up old jobs.

Price controls in America and softening steel demand has slowed German steel product exports to America. Mr. Orban notes that the major exports are pipe for U. S. oil fields, ball bearing tubes, and wire products.

German steel output is about 14 million tons per year. Steel is in greater shortage in Europe than in the U. S. This has bred a gray market and recently one shipbuilder had to turn to Japan for 8000 tons of plate.

Mr. Orban commented on a new type die for precision drop forging of gears. Bevel gears can be hot-forged to a tolerance of .02 in without machining. Conventional machines can be used with the new dies, which get a special treatment and take forgings up to 10 lb. The new die may be brought to America by the domestic auto industry.



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AMERICAN BRASS COMPANY'S
BUFFALO PLANT

TORRINGTON #1860 BAR COILER

- Adjustable, *ELECTRONIC* control of speed and tension!
- Works on standard alternating current!
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If you face the problem of coiling extruded non-ferrous bars of any composition up to 7½" wide and ½" thick, this revolutionary Torrington machine has the features you need:

- 1 Adjustable automatic *electronic* control of speed and tension, to synchronize with the speed of the bar as it is extruded.
- 2 Variable speed from standard AC power supply—no expensive DC installation needed.
- 3 Air-operated ejector pushes finished coil off machine.
- 4 All parts above table top are arranged for easy removal to provide unobstructed flat working surface or allow extruding straight lengths without interference. Air-powered pins of pin-type coiling reel retract flush to table top.
- 5 Built to the precision standards for which Torrington machines have been famous for 65 years.

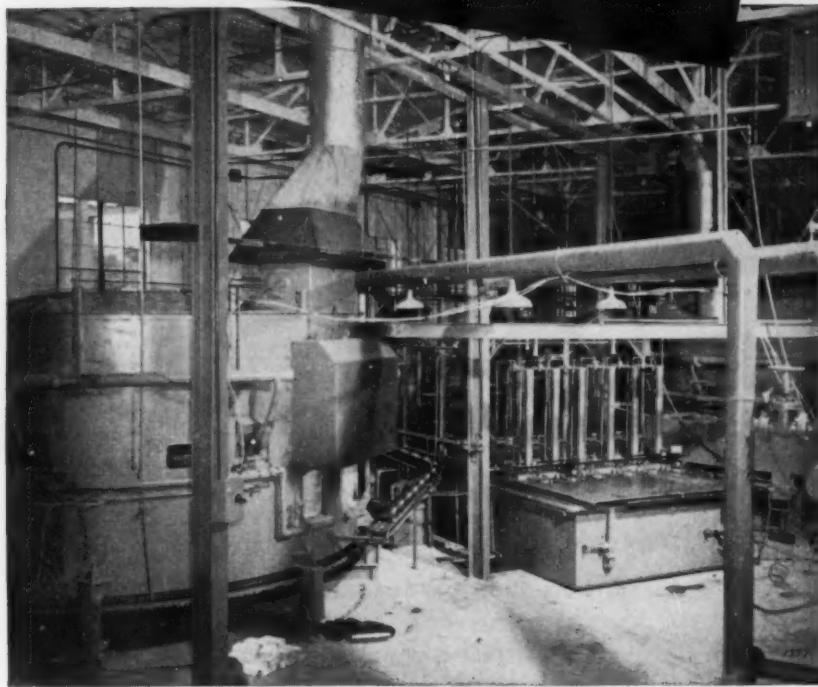
Torrington's decades of experience and knowledge, gained from continuous collaboration with foremost makers and fabricators of metal, are at your service to help you put this revolutionary new Bar Coiler — or any other Torrington special-purpose machine — to profitable use in your plant.

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Expansion

No Stress on Semi-Finished

When Pittsburgh Steel Co. completes its "Program of Progress" its sales of semi-finished, now 32 pct of its volume, will drop to zero. Trend of product mix is:

	Present	Future
Semi-finished	32 pct.	0 pct.
Sheets and strip	0 pct.	32 pct.
Tubular	35 pct.	27 pct.
Wire	33 pct.	21 pct.

Pittsburgh's expansion program includes acquisition of The Thomas Steel Co., installation of a new blooming-slabbing mill, an increase in blast furnace capacity of 100,000 tons per year to 940,000 tons, an increase of openhearth capacity of 488,000 tons per year to 1,560,000 tons, installation of a continuous 66-in. hot rolled sheet and strip mill, and installation of a 4-stand tandem 66-in. cold-rolled sheet and strip mill.

Question Croning Patents

Although it's reported patents have been applied for, no patents exist governing use of shell molding, Richard Herold, manager, Foundry Products Dept., Chemical Div., Borden Co., told members of the American Society of Tool Engineers meeting in Chicago on Wednesday of this week.

The fact that some of the larger foundries are furthering plans for shell molding seems to indicate their legal departments have found no serious barriers to use of the Croning Process, he said. Just to be safe, Mr. Herold suggested, some legal advice should be sought before a foundry goes ahead.

He reported that 23 foundries are now using shell molding as compared with only three a year ago. In addition to automotive parts, previously fabricated, forged, or conventionally cast, the growing list of shell molding applications includes railroad castings, plumbing fittings, water pumps, diesel castings, etc.

Experience to date indicates that all commercial metals can be cast with the Croning Process, Mr. Herold explained. Practical castings size has increased from 30 lb to 200 lb and production speeds have gone from 3 to 4 min to 30 sec and less.

Financial

Writeoffs Issued for Nitrogen

Additional production of 425,000 short tons of contained nitrogen is expected to be the result of issuance of certificates of necessity to ten chemical companies.

This brings total planned expansion of nitrogen facilities to 2,855,000 tons, still 75,000 tons short of the capacity aimed at by 1955.

Firms receiving the certificates, construction cost, and estimated production of the plants are:

Allied Chemical & Dye Corp. (Solvay Process Div.), \$24,600,000 cost, 61,700 tons; Sid Richardson, \$19,000,000 and 86,400 tons; Deere & Co., \$18,500,000 and 57,000 tons; W. R. Grace & Co., \$15,466,000 and 72,000 tons; Cooperative Farm Chemical Assn., \$13,818,000 and 51,800 tons.

Also, Delta Chemical Corp., \$8,892,000 and 25,900 tons; National Chemical Co., \$7,212,000 and 34,500 tons; Pacific Chemical Co., Inc., \$5,735,000 and 18,100 tons; San Jacinto Chemical Corp., \$900,000 and 11,500 tons; and, Mathieson Chemical Corp., \$411,000 and 5500 tons.

Textile Machinery Business Ended

It was decided at a recent special stockholders' meeting in Portland, Me., to discontinue the textile machinery business of H & B American Machinery Co. and to sell all assets. Failure to secure more working capital and the extended slump in the textile business were prime factors in the decision. The firm is considering other work.

More of Everything But Profits

U. S. Steel Corp. reached new record peacetime highs in everything except profits last year. The reason, of course—taxes.

In the annual report released this week the No. 1 steel producer showed total sales of \$3,524,121,226 compared to \$2,956,406,146 for 1950. Estimated federal income tax bite will be \$398 million or \$164 million over the 1950 figure of \$234 million. This was shown in the 55¢ per share dividend drop.

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HERC-ALLOY

SLING CHAINS

STRENGTH—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

SAFETY—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.

● Serial number permanently affixed near top link for positive identification.



● Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.



EFFICIENCY—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

PREFERENCE—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

Write for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

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Other Factories at Angola, N. Y., Dixon, Ill., St. Catharines, Ont., and Johannesburg, South Africa.

March 20, 1952

Control Costs!

On your scale metal becomes money!



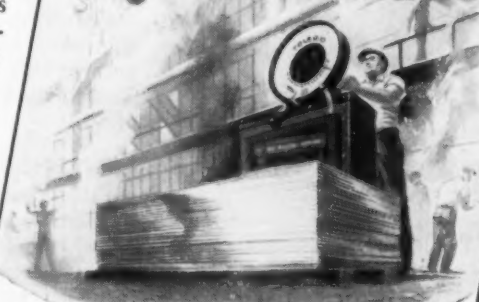
PRINTWEIGH STOPS ERRORS... Provides printed weight records—at the instant of weighing—assuring that the accurate indication of the Toledo dial will reach your accounting records without chance of human error.

Modern Toledos meet your needs today for rapid, accurate scales in all phases of production... to help you control costs!

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HEADQUARTERS FOR SCALES

—Defense Contracts

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal, and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Ordnance Tank Automotive Center, Detroit.
Machine sand blast portable, 200, 52-2012B, Apr. 4.
Guide eng valve assy, 7500, 52-2134B, Apr. 4.
Valve oil cooler by-pass, 140, 140, 52-2134B, Apr. 4.
Valve exhaust, 15000, 52-2134B, Apr. 4.
Ring set eng piston, 1400, 52-2134B, Apr. 4.
Sump fuel tank, 100, 52-2292B, Apr. 4.
Rod connecting throttle, 350, 52-2292B, Apr. 4.
Kit repair winch, 500, 52-2246B, Apr. 4.
Housing trans gear shift, 1599, 52-2246B, Apr. 4.
Power take off assy, 34, 52-2246B, Apr. 4.
Yoke rear connecting rod, 50-52-2246B, Apr. 4.

Detroit Arsenal, Centerline, Mich.
Box aluminum alloy casting, 126 ea., 52-238B, Apr. 29.
Cover inst panel warning light aluminum casting, 2320 ea., 52-238B, Apr. 29.

Ordnance Tank Automotive Center, Detroit, Mich.
Faucet assy water, 5000, 52-2180B, Apr. 2.
Nut gland hand pump, 1600, 52-2180B, Apr. 2.
Jet accelerating eng carb, 10000, 52-2180B, Apr. 2.
Kit repair governor, 460, 52-2189B, Apr. 2.
Governor assy, 300, 52-2189B, Apr. 2.
Shaft propeller universal joints, 40, 52-2178B, Mar. 24.
Piston frt wheel cyl, 45000, 52-2163B, Apr. 14.
Brake RH complete assy, 1450, 52-2163B, Apr. 14.
Rod brake master cyl, 2000, 52-2163B, Apr. 14.
Valve air brake foot control, 300, 52-2163B, Apr. 14.
Kit repair eng carb, 140000, 52-2336B, Mar. 24.

Rock Island Arsenal, Rock Island, Ill.
Sander, electric portable, 25 ea., 11-070-52-711B, Mar. 27.
Wrench electric reversibles, 850 ea., 11-070-52-711B, Mar. 27.
Drill-electric-portable, 3500 ea., 11-070-52-724B, Mar. 26.

District Engineer, New York.
Planetable, 18 x 24" field artillery in accord w/Mil-P 10813A dtd 7-9-51, consisting of 1 ea. board, board case, tripod case, brass plumb, plumbing arm, tripod, 189 ea., ENG 30-473 52-498B, Mar. 20.

Watertown Arsenal, Watertown, Mass.
Vertical furnace, 24' long, drawings, 2 ea. 52-149B, Apr. 7.

Watervliet Arsenal, Watervliet, New York.
Steel crank-outer assy, 2400 ea., 52-120B, Apr. 7.
Steel plunger part, 1800 ea., 52-120B, Apr. 7.
Steel pin part, 8000 ea., 52-120B, Apr. 7.
Spare parts for 40MM gun, 290 to 19000 ea. 52-120B, Apr. 7.

Corps. of Engineers, St. Louis.
Magnesia, block flat, 3900 ea., Eng-23-055-52-662B, Mar. 26.

Navy Purchasing Office, Washington.
Float, welded, steel, 449, 4954S-B, Apr. 8.
Pump, diesel engine, 36, 4986S-B, Apr. 8.
Drills, twist, high speed, 454400, 5970B, Mar. 28.
Sockets, 6 8 11 point, 127782, 5984B, Mar. 31.
Adapters, socket wrench, 84456, 5985B, Mar. 31.
Lifters valve removable jaws, 628, 5429Q, Mar. 29.
Wrenches adjustable auto box, 96186, 5964B, Mar. 24.
Pliers brake spring adjustable, 59714, 5965B, Mar. 24.
Extractors-screw, 11115, 5973B, Mar. 24.
Chasers thread dies taps, 19690, 5974B, Mar. 24.
Pistol container aluminum, 13166, 5860-Q-B, Apr. 9.
Motor starter generator, 8, 6000 S-B, Apr. 3.
Machines electric polishing, 26, 5980B, Mar. 27.

Corps. of Engineers, Chicago.
Bit-rock-drill steel, 11060 ea., B-237B, Apr. 1.
Drill steel-pneu drill, 1120 ea., B-237B, Apr. 1.

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Rack, arm carbine, 3,000, \$44,400, Moyer Metal Products, La Porte, Ind.

Machine, tools, 199 ea., exceeds \$250,000, Smhart Mfg. Co., Portland, Conn.

Range, domestic, 594, \$34,711, The Sunray Stove Co., Delaware, Ohio.

Inserts & Covers, 52-760B, 85000 ea., \$59,780, Aluminum Goods Mfg. Co., Manitowoc, Wis.

Gasket, container, 52-760B, 95000 ea., \$116,190, Hood Sponge Rubber Co., Chicago.

Cylinders, lifting, hydraulic, 672, \$126,000, Rivet Lathe & Grinder, Inc., Brighton, Mass.

Spare parts, 4670 ea., \$6,027, Rivet Lathe & Grinder, Inc., Brighton, Mass.

Primer, percussion, exceeds \$250,000, Automatic Machine Products Co., Attleboro, Mass.

Box ammunition, cal. 50, M2A1, exceeds \$250,000, Burrows Corp., Portland, Me.

Torpedo depth, roll & speed recorders, 10 ea., \$38,500 Foxboro Co., Foxboro, Mass.

Dummy cartridges Mk., 15,000 ea., \$340,050, Stahot Heater Corp., Brooklyn.

Rocket motors, 100,000, \$3,032,000, C. B. Cottrill & Sons Co., Westerly, R. I.

Sand trap assy., 6 ea., \$49,402, Barnes Mfg. Co., Mansfield, Ohio.

Valve, semisteel, 275 ea., \$30,935, Crane Co., St. Louis.

Wheel & brake assy., \$1,031,792, Bendix Aviation Corp., South Bend, Ind.

Power plants, 1987, \$2,235,180, Fairchild Engine & Airplane Co., Farmingdale, N. Y.

Milling machines, 69, \$1,071,766, Seifrent Elstad Machinery Co., Dayton.

Lathes, 85, \$977,321, C. H. Gosiger Machinery Co.

Lathes, 133, \$564,989, Cincinnati Lathe & Tool Co., Cincinnati.

Processing machine, 241, \$1,026,509, Houston-Fearless Corp., Los Angeles.

Generators, 2134, \$1,109,347, Jack & Heintz, Inc., Cleveland.

Power unit, 3036, \$2,491,445, Sampsel Time Control, Inc., Spring Valley, Ill.

Machinery & equipment, \$2,200,000, The Parker Appliance Co., Cleveland.

Tank, T48, exceeds \$250,000, Chrysler Corp., Detroit.

Gun, twin 40MM & spare parts, exceeds \$250,000, Amer. Car & Foundry Co., New York.

Repair parts for pumps, compressors & turbines, 177605, \$2,039,412, Worthington Pump & Machinery Corp., Harrison, N. J.

Rocket assys., HE, AT 3.5", M28A2 & smoke WP, T127E2, exceeds \$250,000, General Motors Corp., Lansing, Mich.

Case, cartridge, steel 75MM, M31A1, exceeds \$250,999, Norris-Thermador Corp., Vernon, Calif.

Cartridge, steel, 75MM, T6E3B1, exceeds \$250,000, Norris-Thermador Corp., Vernon, Calif.

Replenishment of hardware, exceeds \$250,000, United Auto Parts Co., Inc., Kansas City.

Replenishment of hardware, exceeds \$250,000, Great Lakes Steel Corp., Detroit.

Maintenance parts, 53,000 ea., \$70,164, The Glenn L. Martin Co., Baltimore.

Shaver, external gear, exceeds \$250,000, National Branch & Machine Co., Detroit.

Handles, socket wrench, 5308, \$118,860, Skyway Precision Tool Co., Alhambra, Calif.

Wrench-sets socket, 8575 sets, 5745, \$75,597, Stevens Walden, Inc., Worcester.

Wrenches, wrench sets, connecting, 26905, 2760 sets, \$97,469, Plomb Tool Co., Los Angeles.

Spare parts, var., \$109,500, Caterpillar Tractor Co., Peoria, Ill.

Spare parts, var., \$290,000, Caterpillar Tractor Co., Peoria, Ill.

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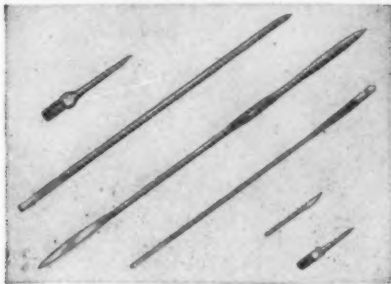
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Construction

Steel Inquiries and Awards

Fabricated Steel Awards this week include the following:

317 Tons, Middletown, Pa., high school building, Neshaminy Joint School Board, Reading Metal Craft Co., Reading, general contractor.

Fabricated Steel Inquiries this week include the following:

3330 Tons, Boston, Mass., furnishing, erecting and painting steel superstructure for John F. Fitzgerald Expressway-Boston connection Part 1 starting at Charles River Bridge. Completion date April 1, 1954. Includes structural carbon and silicon steel.

1200 Tons, Kankakee County, Ill., Section 1407.

165 Tons, Sangamon County, Ill., bridge section 110X-6VG.

Reinforcing Bar Awards this week include the following:

280 Tons, Chicago, housing project 2-15, to Robbins & Co.

165 Tons, Lowell, Mass., construction of bridge substructure. Allied Engineering Corp., Roxbury, Mass., low bidder.

160 Tons, Midlothian, Ill., Bremen High School, to Stanley A. Nelson, Chicago.

Reinforcing Bar Inquiries this week include the following:

395 Tons, Chicopee and West Springfield, Mass., construction of a bridge superstructure between these two communities. C. B. Raymond, Greenfield, district engineer; Completion date Oct. 23, 1952.

New Building at \$4.1 Billion Mark

New construction got off to a good start in 1952—despite materials controls and other limiting factors—showing no change from the first 2 months last year. Total was about \$4 billion for the first 2 months, split equally between January and February.

Changes in types of construction have taken place, however. Sparked by the expansion of the steel, aluminum, and aircraft programs, industrial type building has offset the sagging commercial types for which materials have been restricted.

Private residential housing work has dropped by 20 pct but the dollar volume for public housing has doubled from last year. This has risen 125 pct as compared with 29 pct for all public works.

Totals for 2 months for major categories, in millions of dollars, are: private residential, \$1,395; public construction, including military, \$1,246; public utilities, including railroad, \$497; industrial, \$405; and commercial, \$242.



pointing problems?

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ing is economical, too, for there is no stock waste.



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TORRINGTON NEEDLE BEARINGS

This Week in Washington

Will Easing Inventory Limits Help?

DPA plans to ease stock restrictions on steel, aluminum . . . Ceiling may go to 60 days . . . But it's doubtful if this will encourage splurge of new buying of metals—By G. H. Baker.

New regulations designed to ease inventory restrictions on steel and aluminum are scheduled for issuance shortly, probably within the coming week.

Under terms of a tentative draft being circulated among Defense Production Administration officials last week, the present 45-day ceiling for manufacturers and other users of the metals would be boosted to 60 days.

Broader Groups—In addition, a key official said, it is proposed to set up broad categories or groupings of items to which the new regulations would apply as opposed to the present system of applying the ceiling to individual items.

This means, it is reported, that users of each metal would be allowed to average their stocks of shapes and forms, such as sheet, plate rods, bars, etc., in controlling the size of their inventories.

No changes in the regulation controlling copper stocks are likely, in view of the continued tightness of supplies.

How Much Help?—It is doubtful that the higher inventory limits will go far toward halting the easing trend in the steel and aluminum markets. For the past several weeks steel users especially have been thinking in terms of balancing their inventories. But they have evidenced little desire to build their stocks beyond legal limits.

In the face of easing market conditions, it is to be expected that manufacturers would become very sensitive to growing inventories of products that are no longer hard to obtain. Steel consumers have re-

acted as expected. An increasing number of them have cut down their buying of easy-to-get items such as cold-rolled sheet and strip, mechanical tubing, and some wire products.

Were it not for the fact that higher steel prices are expected to result from the steel wage settlement, reluctance to build inventory would be even more noticeable. Controls officials, who have already been embarrassed by guessing wrong on the steel market, might find their present position on decontrol untenable once the wage-price question is settled.

Contract Confusion — Labor Dept. is proposing to revise the Walsh-Healy Public Contracts Act so as to clear up confusion over the responsibilities of primary and secondary contractors.

Walsh-Healy law provides for the inclusion in all government supply contracts in excess of

\$10,000 the conditions prescribing minimum wages, overtime, child labor, and safety and health standards.

Under the new proposal, a primary contractor subject to the law may use secondary contractors if he notifies them that their operations also are subject to the law and its labor standards—and if he expressly agrees that he will be liable for any violations by the secondary contractor.

Won't Swear to It — National Labor Relations Board withdrew a certification and bargaining order it issued because the union involved failed to file non-Communist affidavits for all its officers.

The action was the first of its kind ever taken by NLRB. Unions involved are United Electrical, Radio, and Machine Workers and its Local 1150. Employer is Sunbeam Corp., Chicago.

NLRB says it was of the opinion at the time it certified the union as the majority representative that its officers had complied with the affidavit provisions of the Taft-Hartley law. Subsequent examinations revealed that the requirements had not fully been met, the board states.



FROM KOREA: Ordnance experts explain Russian equipment captured by UN forces in Korea to soldiers training at Aberdeen Proving Ground.

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DEFENSE: How Much It Costs You

Appropriations for military spending since Korea may hit \$87 billion mark by July 1 . . . Weapons procurement has cost \$47 billion in past 19 months, construction \$2.9 billion.

Money allotted for military procurement and construction programs since the Korean fighting began may reach \$87 billion by the end of June.

Defense Dept., in making this announcement, said that in the first 19 months following the North Korean attack it obligated \$57 billion for these programs, with \$47.5 billion being spent for actual fighting implements, \$6.6 billion for clothing, subsistence, and petroleum, and \$2.9 billion for construction.

More than 38 pct, or \$21.8 billion, of procurement and construction funds was accounted for by the Air Force during the 19-month period. Army and Navy obligations for those months were \$20.3 billion and \$14.9 billion, respectively.

Three-Way Split—In the first 7 months of the current fiscal year, the Air Force contracted to spend more than one-third (\$8.5 billion) of all military money earmarked for construction, plant expansion, and buying of equipment and supplies. Within the same time Army and Navy funds were equal in size—\$6.4 billion each.

Obligations named include orders actually placed during the 7-month period and comprise both contracts with private industry and project orders to military plants, such as shipyards and arsenals.

Military spending for pay and allowances, research and development funds, and similar programs boosted total commitments to \$31.3 billion in the July 1, 1951-Jan. 31, 1952 period.

Federal Agencies Get Petty Cash

Regulations have been set up by which cash sales of \$50 or less can be made to federal agencies without use of the well-known many forms and carbons.

Petty cash funds will be established for the agencies under the new procedure approved by the Treasury, General Accounting Office, and General Services Administration.

Normally, any purchase requires a minimum of six documents, sometimes more. Under the new rules, GSA says, "proper use of the imprest funds" reduces the operation to only a requisition and a sales receipt.

Republicans Will Investigate IMC

In Washington, four subcommittees of a 70-man group named to give close scrutiny to the International Materials Conference are expected to bring detailed reports before Mar. 31.

Protesting that IMC is a "mysterious, extra-legal super-cartel," Rep. Martin, R., Mass., recently called together GOP congressmen from 59 areas where unemployment is said to have been caused by shortages of critical materials. From this group, he selected the following representatives as subcommittee heads:

George A. Dondero (Mich.)—automobiles; Antoni M. Sadlak (Conn.)—electric; Edward H. Jen-



EN ROUTE: This hundred-thousand-lb crown for a metalworking press is loaded in New York for Automobile Peugeot, Paris. Made by E. W. Bliss Co., Canton, Ohio, it will be used to stamp large car body parts.

ison (Ill.)—equipment and users; and Frank T. Bow (Ohio)—legality of IMC.

"I think it is our plain duty," Martin said, "to discover where responsibility for IMC rests and where this organization is headed."

State Will Help—Official attitude at State Dept., which supplies a number of U. S. staff members to IMC, is that of welcoming the opportunity to present the congressmen with details on organization and purpose of the international agency.

Defense Production Administration, which spoke up for IMC last month after Sen. Ferguson, R., Mich., had charged that operations of the agency were causing shortages of vital materials, is expected to make public soon its evaluation of IMC's work.

More Copper Production Needed

New production sources for copper to provide about 250,000 short tons will have to be developed with government aid over the next 3 years, DPA says.

Otherwise, if DPA officials are right, the supply by 1955 will not meet the estimated demand of 2,270,000 tons. This figure is an increase of 107,000 tons above 1950 consumption.

Here is how DPA figures it: Present rate of domestic production is estimated at 1 million tons for 1952. But about 80,000 tons will be lost over the next 3 years by depleted mines.

Idle scrap will also be pretty well recovered by that time, and the recovery rate will settle down to about 450,000 tons. Meanwhile, the import rate is expected to rise to 650,000 tons, making a total of 2,020,000 tons from these sources. The remainder would have to come from new production.

MSA Allows Foreign Export Buying

Mutual Security Agency last week authorized Belgium-Luxembourg to purchase \$1 million worth of motor vehicles, engines, and parts.

Industrial Briefs

New Plant—C & H SUPPLY CO., Boeing Field, Seattle, has opened a new plant at Inglewood, Calif. Output of the new factory has made it possible to reduce the time required to fill orders.

Increased Facilities — Springfield Works, Tractor Div., ALLIS-CHALMERS MFG. CO., will add a new plant. Plant will cost approximately \$15 million and will occupy 300,000 sq ft of manufacturing floor space.

New Division—A. A. MORRISON CO., INC., Buffalo, has added a Scrap Div. to the firm. This division will conduct trading operations in all grades of scrap iron and steel.

Loan Obtained—DETROIT BROACH CO., Detroit, have obtained a \$680,000 loan from the Reconstruction Finance Corp. for a new plant and equipment. Company must borrow \$100,000 elsewhere and obtain agreements protecting the government against \$23,171 existing indebtedness.

Contract Awarded—A \$200,000 contract to develop use of titanium alloy in the manufacture of jet parts has been awarded CONVAIR CORP., Fort Worth, Texas.

Course Offered — BOSTON COLLEGE, Boston, is offering an intensive course in Modern Industrial Spectrography, July 21 to Aug. 1. This course is designed particularly for chemists and physicists from industries in the process of installing spectrographic equipment.

Natural Gas Plans — SOUTHERN NATURAL GAS has announced a \$76 million 3-year construction program that not only will supply natural gas to 22 towns but will also increase supplies for 84 towns already being served.

Special Steel — CRUCIBLE STEEL CO. OF AMERICA, New York, is working on steel armor plate that will resist shells. The specialty steel company's Spaulding plant is turning out a high-quality, heat-treated ballistic armor casting of low alloy steel for use on U. S. army tanks.

Expansion Announced—As a result of the rapidly growing increase in carrier, telemetering, and control systems engineering and sales activity, the Carrier and Control Systems Engineering Dept. of MOTOROLA, Chicago has been expanded.

Fellowship Awarded—C. Dale Dickson, an Allis-Chalmers research engineer has been awarded an ALLIS-CHALMERS FELLOWSHIP for 12 months of residence study for a Ph.D. in metallurgical engineering.

Added Space—CROSS CO., Detroit, will add 33,000 sq ft of space for machine tool production when remodeling of a recently purchased building is completed April 1.

New Laboratory—A new web coating research and development laboratory was opened recently by INDUSTRIAL OVENS, INC., Cleveland.

Change of Address—The executive offices of the AMERICAN ELECTROPLATERS' SOCIETY will move to the American Building, 445 Broad Street, Newark 2, N. J., on April 1.

Moves Offices — DOEHLER-JARVIS CORP., is moving its executive offices from New York City to a new building adjoining the company's plant at Toledo.



Congratulations — The EDWIN F. GUTH CO., St. Louis, will celebrate its Golden Anniversary on April 22.

Order Received—YORK CORP., York, Pa., has received an order for approximately \$435,000 to air condition two buildings of the Consolidated Vultee Aircraft Corp. at Pomona, Calif., which will be used for the manufacture of guided missiles for the U. S. Navy.

Office Opened—The C. O. BARTLETT & SNOW CO., Cleveland, is opening a Pittsburgh office at 91 Central Square, Pittsburgh 28. Mr. John M. Marston will represent all phases of the Bartlett-Snow line.

Construction Started — MASSEY-HARRIS LTD., Racine, Wis., has started foundation work on the erection of a \$2,500,000 machine shop at King and Shaw Streets, Toronto, and expects to have the plant completed and in operation next fall.

Expansion Program—A half-million dollar expansion program which will provide new facilities for the Capacitor, and Metals & Ceramics Divs. of P. R. MALLORY & CO., INC., Indianapolis, is underway.

Name Changed — KROPP FORGE CO., Chicago, has changed the name of its wholly-owned subsidiary, A. C. Woods & Co., Rockford, Ill., to Kropp Steel Co. It is engaged in the steel fabricating and weldment business.

Deposits Discovered—Iron ore deposits have been discovered in four MISSISSIPPI counties. James S. Attaya, geologist, estimates there are 6,400,000 long tons of iron ore that can be mined in Lafayette, Webster, Marshall and Benton Counties.

New Location—Utah-Intermountain district office, Dept. of Public Relations, UNITED STATES STEEL, is now located at 320 Kearns Building, Salt Lake City.

Sales Agency Established—A sales agency to serve industrial customers has been established by Jack Dushman, at 4022 Carrollton Ave., Indianapolis.

BUSINESS IN MOTION

To our Colleagues in American Business ...

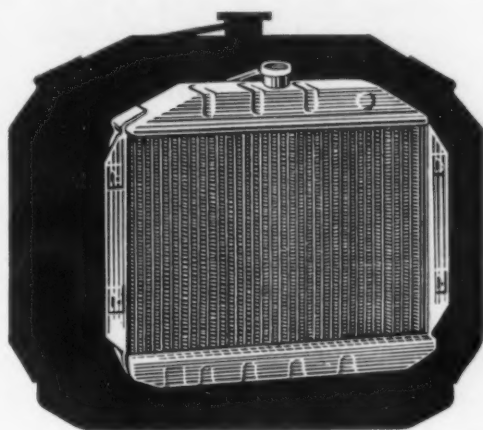
Substitution of materials is of considerable concern to many manufacturers these days. Never before have we seen so much interest in the subject. However, it is by no means new to Revere, which has always held to the principle of recommending the metal that will best serve the customer. Thus, we have often suggested switching from one metal or alloy to another, with the object of lowering costs, increasing production, improving service, or all three.

When based on a detailed study of all the factors involved, substitution at times can be extremely valuable. In fact, the ever-increasing quality and service to be found in American products is due in part to the continued search for better materials, and their adoption when found. Better materials, better design, finer workmanship—these are part of American progress.

But there are instances, of course, when no practical substitute can be found, when only one material offers just the right combination of good qualities required for a given application. Take the automobile radiator. This has always been made of copper, because copper is the one and thus far only metal that perfectly meets all the requirements of manufacture and service. To make a radiator, very thin copper sheet and strip must be crimped, bent and otherwise formed. Copper's easy workability makes it ideal from the manufacturing standpoint. After assembly, the radiator is cleaned, and made water-tight by dipping in a bath of hot solder. Copper is exceptionally easy to solder. When in service on a car, truck or bus, the radiator must not rust, and must resist

corrosion by water and anti-freeze. Copper is notable for its resistance to corrosion in such use. The radiator must also cool the water by radiating its heat into the air stream; copper has the highest heat conductivity of all commercial metals. A copper radiator thus is the most efficient and durable. It should outlast the car unless accidentally damaged, and when the injury is not so great as to make replacement necessary, the nearest shop can make repairs easily.

Recently it has been suggested that automotive radiators should be made of aluminum. However, both copper and aluminum are temporarily in short supply, and therefore to substitute one for the other does not appear to be practical. Beyond that, we do not believe—based upon experience to date—that aluminum's qualities, fine though they are, necessarily make it suitable for automotive radiators. In addition, the difficulties of



retooling in the factory and repairs in the field must be considered. Revere fabricates both copper and aluminum, and we have reason to believe that our impartial advice to stay with copper for automotive radiators is concurred in by radiator manufacturers.

When you are tempted to substitute one material for another in your product, no matter what it may be, make certain you obtain all the facts as to costs, production, service. Your suppliers will be glad to collaborate with you in studying the effects of a proposed change. We suggest you take full advantage of their knowledge and experience.

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The Automotive Assembly Line

New Engine Programs Uncertain

Coming expiration of priorities for high compression units could hurt future plans . . . But car makers expect reissue . . . Hope to use higher power engines soon—By R. D. Raddant.

Approaching expiration date of the priority classification covering high compression automobile engines throws a shadow of doubt over new engine plans of several automobile companies.

The present DOU-4 priority runs out Apr. 15, with this classification to be replaced by a new priority designation, DOZ-3. Automobile manufacturers are confident that their priorities will be reissued for high compression engines, but if not, new engine plans of the industry will be vitally affected.

It now appears that Buick, Dodge, Mercury, Ford V-8, and Ford tractor are all going to have new high compression engines in 1953. Packard, Pontiac, and Chevrolet are in the tentative or rumored stage. Even if all priorities are not re-validated, the Buick, Dodge, and Ford programs should go through.

Changes Rumored—Recently an order was placed by Packard for V-8 block and head toolings. Chevrolet has ordered an increase in production of the high powered engine used in Power Glide transmissions. Reports persist that Chevrolet is planning pressure lubrication and aluminum pistons.

Rumors are that Chevrolet may drop its present small engine in 1953. Reports about Chevrolet's plans to produce a new V-type high compression engine this year are heard, but no tool orders have been placed to give substance to this talk. Pontiac is expected to place orders soon for tooling a new V-8 engine.

Out of Work—Detroit's unemployment, steadying at about 100,000 jobless, continues to be a criti-

cal problem and also appears to be the major factor in obtaining increases in automobile production.

The pressures created by this serious situation were largely responsible for the recent boost of second quarter auto production allotments and both auto and steel men believe its continuation should result in much larger quotas in the third and fourth quotas.

Unemployment provides a rare opportunity for the industry, labor and congressional representation to form a united front toward a common goal. It is difficult to imagine Washington not yielding to this combined effort.

As a result, steel companies have already been notified to be ready for greatly accelerated third and fourth quotas after completion of 1,050,000 passenger cars in April, May, and June.



HEAT TREATING: Gear rings are flame-hardened at Chrysler Corp.'s Highland Park Plant. Gas flames of 1450°F give extra-hard surface to gear teeth during the 14-min cycle.

Best Reason—While there may be other good reasons for remedying the unbalanced situation, employment provides the best basis and most effective sounding board.

Unemployment of over 100,000 in the three-county Detroit metropolitan area is not exactly unusual in that it occurred four times previously in the post-World-War-II period.

The present situation, however, is the first in which the jobless climbed to this level without a major strike or the combination of a strike and model changes. In November, 1949, for example, the steel strike effect and changes resulted in the highest unemployment since the General Motors strike in 1946.

Of the 102,000 unemployed now, it is difficult to determine how many are due to automotive layoffs. Only 57,684 are valid unemployment insurance claims with 8900 having exhausted benefit rights. Claimants disqualified because of separating circumstances total 5550 while 9300 from covered industries did not file claims.

Copper Again—If expected auto production boosts materialize, the crux of the situation will lie in the critical metals, particularly copper. While steel might become tighter, no one in the auto industry thinks it will be a problem unless the threatened strike develops.

One major buyer predicts confidently that copper will be available in the third and fourth quarter if production is accelerated. He is sure the copper industry is worried that inroads being made into copper use by substitution will become permanent.

As a result, he feels certain that copper producers will make every effort to meet the auto industry's demands.

Sales Worries—Higher auto production in the last half of the year.

Turn to Page

as now seems certain, will reverse the entire pattern of production and sales. This will create a problem that some of the independents may find difficult to solve.

The established seasonal pattern is to have high production early in the year to be ready for spring and summer sales. Most car buyers don't enter the market until warm weather and good driving give them the urge to get behind the wheel of a new model. Buyers' resistance climbs as the driving season grows shorter and reaches its peak at the end of the year.

There is little doubt that the Big Three can sell quotas in spite of the unbalanced production years, but independents will have trouble and are fearful of a soft market as the year wanes.

Ford Combines Manufacturing

Production of Mercury cars has been shifted to the Lincoln plant with Lincoln and Mercury cars being produced under the same roof for the first time in Ford Motor Co. history.

S. W. Ostrander, operations manager of the Lincoln-Mercury Div., announced that Mercury production was moved to the single plant from branch plants at St. Louis, Metuchen, N. J., and Los Angeles. Mercurys were produced at the Rouge plant until last summer when production was moved to the branches to make room for added Ford manufacture.

Power Steering Demand Good

Buick Div. of General Motors reported it could sell twice as many cars equipped with power steering if the units were available.

Ivan L. Wiles, general manager of Buick and vice-president of GM, announced that production of power steering equipped cars is running about 35 pct of the Roadmaster output and that "we could easily sell twice that many."

Facilities for power steering are being doubled at present time, Mr. Wiles said.

Reds:

UAW starts purge of communists controlling Local 600 at Ford.

Wholesale disclosures and charges of Communist domination of Local 600 led the Executive Board of the United Automobile Workers into the fight to purge its own largest local of the Communist element.

Former officials of Local 600, the Ford Motor Co. local, charged that a Communist and fellow traveller network completely dominated the controlled policies of the 60,000 member local.

Even the editor of *Ford Facts*, the union publication, told the House Un-American Activities Committee at sessions in Detroit that his paper was Red-controlled and a "minor edition of the *Daily Worker*."

In Control—Lee Romano, former vice-president of the Local, said that 175 Communist party members and about 2000 sympathizers controlled the General Council, Executive Board, and the newspaper.

Both he and David Averill, editor of *Ford Facts*, admitted they at one time were party members.

These disclosures prompted UAW President Walter Reuther and the International Executive Board to declare war on Carl Stellato, Local 600 president, in a move to appoint an administrator for the local. Such a move would probably result in a special election of local officers and send the present ones back to their jobs unless reelected.

This move by the Executive Board brought to a head the smouldering Reuther-Stellato war that broke out between the two former friends and allies at the UAW convention in 1951.

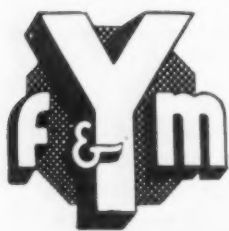
Raise Ceilings on Nash Cars

Higher basic retail prices are in order, the government says, for the Statesman and Ambassador series of 1952 Nash automobiles. The approved increases range from \$173.45 to \$189.85 for the Statesman series and from \$178.55 to \$190.30 for the Ambassador.

THE BULL OF THE WOODS

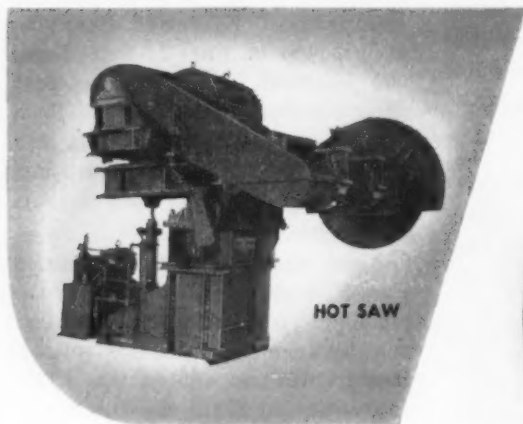
By J. R. Williams



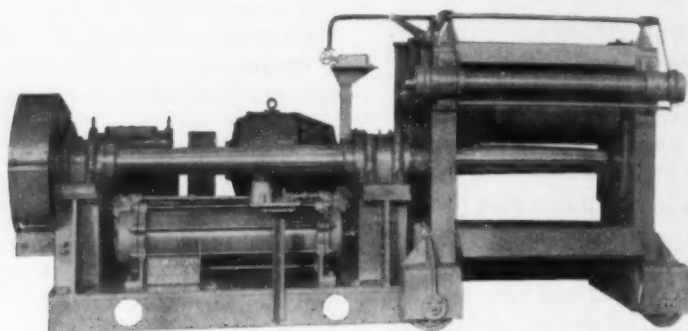


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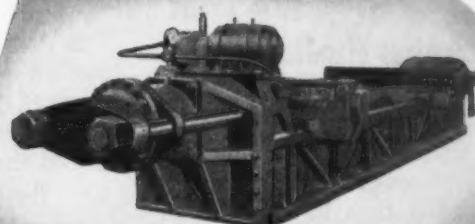
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West Coast Report

Steel Output Beats Estimates

Western production in 1951 almost 500,000 tons over most optimistic predictions . . . Year's yield nearly 4.9 million tons . . . Newer producers important . . . Steel expansion justified.

Once again western steel producers have exceeded their most optimistic predictions on production.

For the past several years THE IRON AGE has predicted with a high degree of accuracy steel production in the seven western States through the cooperation of practically all steel producers in the area. Confidential surveys show that even the most optimistic estimates of 1951 production made by the producers themselves were exceeded by approximately half a million tons.

In 1951 western producers poured at least 4,893,000 tons of steel as ingots and castings. It was forecast here last April that 1951 ingot production would be about 4,462,000 tons.

Part of the discrepancy between the forecast and actual steel production figures can be accounted for in part by the fact that ingot totals now include several large steel producers without finishing facilities.

More Accurate—Accompanying table shows total production of major finished products broken down to a greater exactness than has before been available. Tabulation shows that producers with rolling facilities turned out 3,673,000 net tons in 1951, which exceeds estimates made last year by about one-half million tons. It also shows that producers expect increases in finished products during 1952 to be some place around 2 pct.

These forecast figures come from hardheaded market analysts and are untinted with blue-sky optimism. There are many competent observers who believe that the seven western States will produce

West Coast Steel Production

	Actual 1951	Estimated 1952
Plates (Sheared and Universal . . .	675,000	702,000
Hot and Cold Rolled Strip	79,000	81,000
Hot and Cold Rolled Sheets and Tinsplate	677,000	704,000
Standard and Line Pipe	644,000	597,000
Structural Shapes	335,000	325,000
Reinforcing Bars	496,000	542,000
Other Bars and Small Shapes Under 3"	479,000	499,000
Wire Products and Wire Rods for Sale	266,000	283,000
Total Rolled Products	3,673,000	3,752,000
*Ingots, Blooms and Billets for Sale	120,000	94,000
*Miscellaneous (Includes Forging Ingots)	22,000	19,000
Total Ingots and Steel for Castings	4,893,000	4,925,000

* These figures are not included in the total of rolled products.

more than 5,500,000 ingot tons of steel during 1952 and that rolled production will be on the top side of 4,000,000 net tons.

For the first time in several

years, steel producers have been reluctant to forecast production schedules, which is understandable in the light of existing controls and obvious and known construction potentials.

Where From—By Whom—A relatively small part of this unforecast, but probable, increase in production of rolled products will come from established steel producers.

Extra production dividends will probably come from such newcomers as Seidelhuber Steel Rolling Mills in Seattle, and Western Tube, currently looking for an electric furnace and tube plant site in southern California.

Last week representatives of Westcorp in Los Angeles made it clear that a projected establishment of an oil field tubing plant in that area was on a realistic basis. This group, headed by A. Melaxa as president and A. Fulga, vice-president, has associated with it Charles Haas, who previous to World War II was general manager of the Mannaasman plant producing seamless tubing in Germany. Westcorp is conducting engineering surveys for Western Tube.

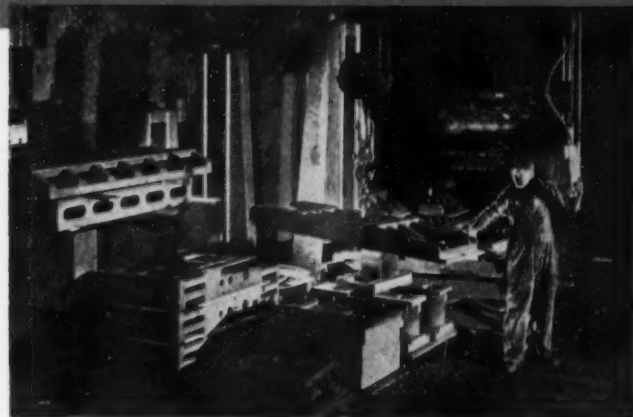
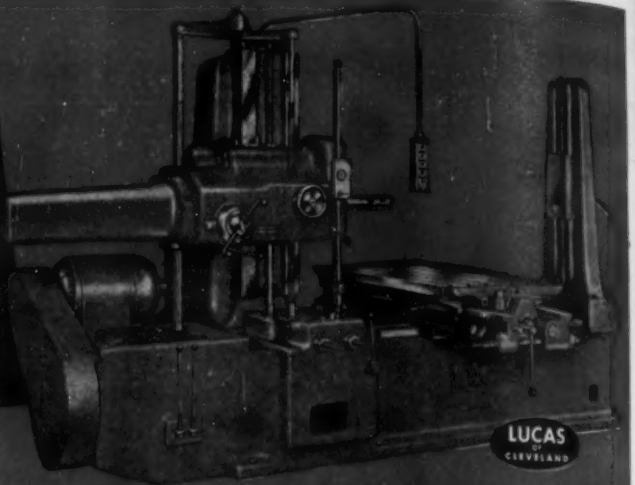
It was confirmed that two 50-ton electric furnaces will be installed in a plant to produce tube rounds from which will be made seamless tubing in diameters of from 2 $\frac{3}{8}$ in. to 9 $\frac{1}{8}$ in.

Is It Needed?—When the justification for steel expansion in the West is questioned, it is a simple matter to point to a multitude of such endeavors as that of Robert B. Allen who has recently been granted a certificate of necessity in the name of Allen Steel Co. of Salt Lake City for \$216,000. Allen's company has a backlog of fabrication orders for the Atomic Energy Commission. While small, when multiplied by hundreds of similar projects in the West, the total becomes imposing and significant.



CONSTRUCTION: Actress Marie Wilson shows Steelworker Bob Sommerville the location of her dressing room in the \$12 million television center being built by Columbia Broadcasting System in Los Angeles.

"Where's the
LUCAS
we need so badly?"



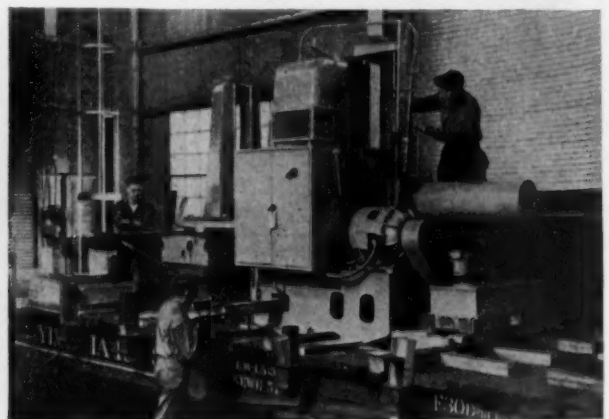
The ultra modern Lucas plant is being used to full capacity with work in process and rough castings waiting to be machined.



Lucas machines at work making components for more Lucas machines, in our plant and in the shops of many outside suppliers.

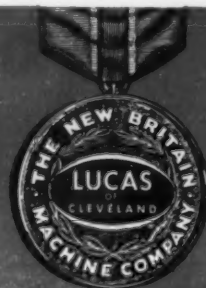


Still no sacrifice of Lucas standards. Ultra modern production methods, but still the skilled hand craftsmanship for which there's no satisfactory substitute.



More shipments than ever, but, of course, defense priorities dictate who gets what. Perhaps this is the machine we originally scheduled for you.

Your inquiry and your order are as welcome as ever at Lucas. Today's conditions won't last forever and your Lucas Horizontal Boring Milling and Drilling machine will always be a time saving money maker.



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Machine Tool High Spots

Do You Want Non-Rated Tool Orders?

Some builders' backlogs aren't up to average . . . Want right to take on non-rated orders later . . . Stress on special tools will follow pilot stage . . . More business seen—By G. Elwers.

If one talks to the right elements in the machine tool industry, it is possible to get the impression that the industry's outlook is fast becoming quite gloomy.

There are many firms whose backlog is nowhere near the 18-month industry average. And their new order volume isn't keeping their backlogs high.

These firms are loudest in wanting the right to fill up their capacity with non-rated business. They may be running at capacity now but they fear in 6 to 8 months they'll have to start cutting back.

Non-Rated Business — They'll have plenty of capacity soon, they say, to take care of some non-rated business without hindering their output for priority customers. They claim they can get the materials they need to build some non-rated machines, without additional allocations.

But there are many indications that things aren't as dark as these machine tool builders think. Many of those with low backlogs are builders of special machine tools. The outlook for such equipment seems to be brightening.

Special Tools Later—Many defense plants are now in operation with pilot lines only. These lines are heavier on standard machine tools than subsequent production lines in the same plants will be.

Production methods have been worked out on these pilot lines. The NPA says a lot of the knowledge thus gained will be translated into *special machines* to get the utmost in output from completed installations.

More to Come—And there is a lot of just plain new business yet to come. Guided missiles, for example, have scarcely begun to take the huge bite of machine tools this program will eventually require.

And the Air Force, having cancelled or cut back programs on planes and engines considered obsolete, can be expected to shift emphasis to increasing production facilities for other products.

Try Subcontracting—But what about the firms that say they need to book new business right now to keep from having to lay off workers in the next few months? Allowing them to take on some non-rated business is one answer to their problem.

Another answer is for them to

look for subcontract business from more heavily loaded machine tool builders. There are still many who are actively seeking subcontractors. No one could do their work better than another machine tool builder.

Stress on Parts—It is true that no one can build a machine tool as well as its own builder can. There is a lot of knowhow involved which can't be put into blueprints and specifications.

But this applies primarily to assembly knowhow. There is a lot of room for someone else to build parts, to be assembled by the original builder. And many hundreds of machines built and assembled by subcontractors are giving satisfactory service.

Interest Wanes—The group of Akron industrialists reported in December in this column as seeking European firms to build machine tools to U. S. designs has lost interest. At least European inquiries have met with little or no response from this group.

The reason given for loss of interest is the improving machine tool delivery picture in this country. But is it probable that there is another good reason: lack of ability to get any U. S. builders to cooperate.

Foreign Exhibits—U. S. machine tool builders naturally don't look with complacency on European invasions of the U. S. market. They are particularly up in arms over reports that some European governments are subsidizing some of the expenses of their machine tool builders who exhibit their equipment over here.

This takes dollars, they point out. And our government is furnishing dollars to these governments. Thus indirectly our government aids subsidized invasion of U. S. markets.



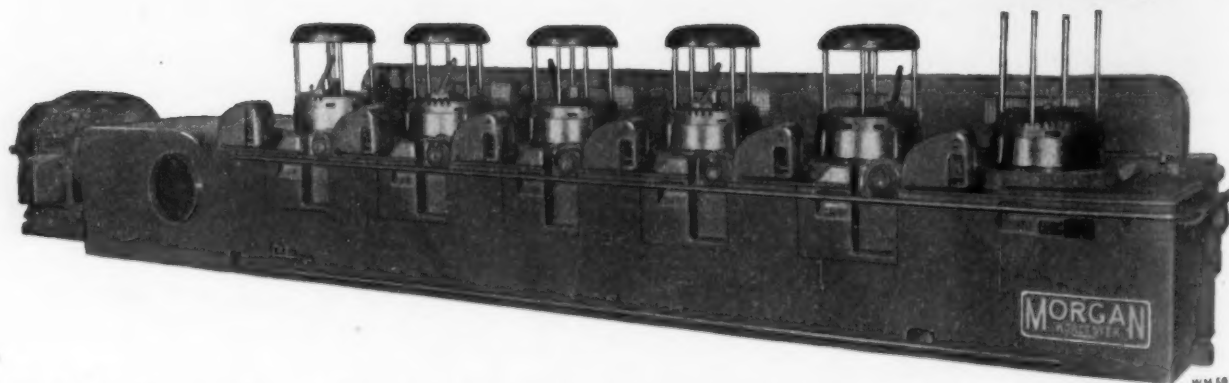
PRODUCTION

Zooming

...but what about the costs?

There comes a time in the life of a machine when efficiency begins to drop and costs begin to rise . . . a time when a machine has run its course profitwise.

Under present high production schedules old machines can quickly mean the loss of a lot of money. A machine-by-machine study will spotlight the wastrels. May we help you make such a study?



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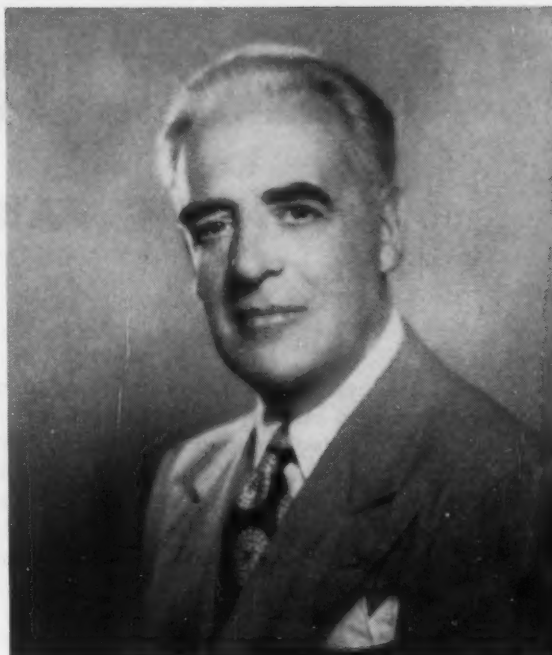
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The **Iron Age**

SALUTES

Cyril J. Bath

A master machine tool designer and builder, he also makes notable contributions to economics.



JACK BATH doesn't hold with narrow specialization. Although he holds an enviable reputation as a designer and builder of machine tools, his varied and broad interests have gained him wide recognition in the fields of economics and social welfare.

English-born, he arrived in this country 45 years ago with a tool kit and 50¢ in his pocket. Today he holds 20 top patents in the world of heavy industry. His latest invention, the Rotary Draw Former, is used for shaping high-temperature-resistant alloys for jet engine parts.

Jack's been a writer and speaker on economics in this country and abroad for 30 years. He's the author of a text on international monetary and credit functions.

In 1932 he advised the Mexican government on the formation of a machine tool program for that country's railroad industry.

While frequenting high places he never forgets the man in the shop. His company's profit-sharing plan of 20 years has received wide acclaim. Jack refers to his 100-man force as partners and means it. They participate in policy-making and dividends. His interest in employee welfare has paid off. There's never been a strike in the Bath plant.

Jack Bath's broad acquaintance with world affairs makes him an artful conversationalist. In leisure moments he takes an interest in the Cleveland Playhouse, of which he was a founder, and enjoys swimming, skating and yachting.

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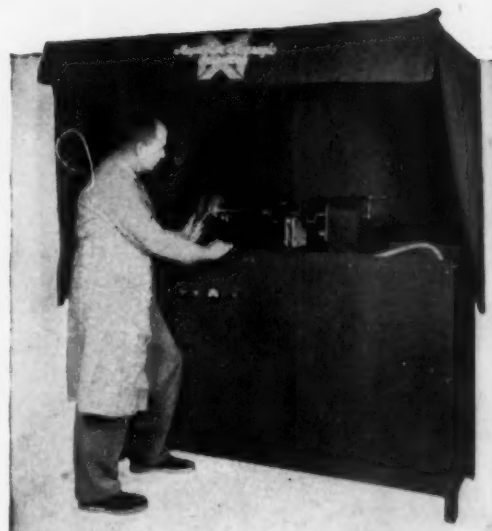
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rate, time consuming demagnetization operation.

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The Iron Age

INTRODUCES

Leonard T. Sylvester, elected president MATHEWS CONVEYER CO., Elwood City, Pa. Odd H. McClearly becomes vice-president and general manager.

William A. Burns, Jr., named president, TRAILMOBILE, INC., Cincinnati; S. E. Biggs, vice-president in charge of manufacturing; and James A. Nickerson, vice-president in charge of credits.

Mangum Webb, elected vice-president, CHEMICAL CONSTRUCTION CORP., New York.

E. E. Ensign, appointed vice-president, A. R. D. CORP., New York.

Malcolm D. Shaffner, appointed executive vice-president, SACO-LOWELL SHOPS, Boston; Robert M. Jones, named vice-president in charge of research and development; and F. Gorham Brigham, Jr., secretary.

A. L. Jones, appointed manager, Water Treating Div., WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.

John P. Emmett, heads new products department, DETREX CORP., Detroit. John Nuber, appointed assistant chief engineer; and Stewart Millar, named supervisor of engineering standards and development.

George A. Bentley, appointed sales manager, stamping division, DETROIT STAMPING CO., Detroit.

Robert M. Fichter, appointed sales promotion manager of consumer products, WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

James W. Ramsey, appointed assistant to general traffic manager, AMERICAN STEEL & WIRE DIV., Cleveland.

C. O. Wamvig, Jr., elected president, PEERLESS MACHINE CO., Racine, Wis.; Frank T. Frey, vice-president; O. M. Jensen, vice-president in charge of engineering; Frank T. Wruk, vice-president in charge of sales; and J. P. Hanson, secretary and treasurer.

Paul R. Turner, promoted to director of sales, Electro-Motive Div., GENERAL MOTORS CORP., La Grange, Ill.

E. R. O'Brien, appointed sales manager, EDGCOMB STEEL OF NEW ENGLAND, INC., Milford, Conn.

Harold C. Erskine, elected assistant division manager of die casting operations, ALUMINUM CO. OF AMERICA, New York.

Roscoe R. Thomas, promoted to chief engineer, manufacturing division of TENNESSEE COAL, IRON & RAILROAD DIV. Birmingham; John W. McWilliams, appointed assistant chief engineer; and John W. Ogletree, made chief draftsman.

Arthur J. Buckley, appointed assistant sales manager, PANGBORN CORP., Hagerstown, Md.

James R. Hughes, named district manager of Denver office, STERLING ELECTRIC MOTORS, INC., Los Angeles.

Robert R. Nadal, promoted to manager of product sales and service; and A. H. Crowley, appointed manager of product promotion and distribution, Lincoln-Mercury Div., FORD MOTOR CO., Dearborn.

Harold L. Herndon, appointed district manager in charge of sales and service, Cleveland district, RAYTHEON CO., Waltham, Mass. Albert R. Wolfe, appointed service manager.



CLINTON F. ROBINSON, named president, Carborundum Co., Niagara Falls, N. Y.



GORDON H. CHAMBERS, elected president, Foote Mineral Co., Philadelphia.



C. K. HOOD, elected vice-president, Worthington Pump & Machinery Corp., Harrison, N. J.

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Personnel

Continued

H. J. Hagn, elected president and a director, **CHIKSAN CO.**, Brea, Calif. **W. Edgar Spear**, became chairman of the board, and **J. H. Robinson**, elected vice-president, and general manager of **Well Equipment Mfg. Corp.**, a division of Chiksan.

D. A. Perkins, appointed assistant purchasing agent, **SOLAR AIRCRAFT CO.**, San Diego.

James M. Walton, appointed plant industrial engineer, **Midland Works, CRUCIBLE STEEL CO. OF AMERICA**, Midland, Pa.

Harry E. Byerrum, appointed sales manager, **BAKER STEEL & TUBE CO.**, Los Angeles.

Paul A. Hilton, appointed treasurer, **MAGNA-CREST CORP.**, New York.

Kenneth M. Morse, appointed industrial hygienist, **U. S. STEEL CO.**, Chicago.

L. B. Shettle, appointed Sioux City, Iowa, branch manager, **FRUEHAUF TRAILER CO.**, Detroit; **Ray Stutzman**, appointed St. Paul branch manager, and **Thomas Cartee**, Sioux Falls, S. D., branch manager.

William F. Skeer, Jr., appointed district manager, Pittsburgh area, **EXOTHERMIC ALLOYS SALES & SERVICE, INC.**, Chicago.

Lyle F. Gulley, appointed director of purchases, **GRANITE CITY STEEL CO.**, Granite City, Ill.

James L. Everett, appointed administrative assistant to the general manager, engineering works division, **DRAVO CORP.**, Pittsburgh.

Arthur H. Smock, appointed traffic manager, **AMERICAN WELDING & MFG. CO.**, Warren, Ohio.

Gosta Almstedt, appointed Eastern district manager, **SANDVIK STEEL, INC.**, New York. **Frank J. Satter**, appointed assistant district manager.

Richard M. Olsen, elected to board of directors, **HUPP CORP.**, Detroit. He succeeds **Willard F. Rockwell**, who resigned.

Sheldon V. Coleman, appointed sales engineer, **Norbide Div. and Floors Div., NORTON CO.**, Worcester. He succeeds **Henry O. Richter**, who has retired.



ARTHUR A. LEVISON, appointed vice-president and general sales manager, **Blaw-Knox Div., Blaw-Knox Co.**, Pittsburgh.



Z. R. WILLIAMS, appointed vice-president and works manager, **Portable Electric Tools, Inc.**, Chicago.



A. RASMUSSEN, becomes vice-president and plant manager, **Fahralloy Co.**, Harvey, Ill.



CLIFFORD R. MEYER, appointed vice-president and secretary, **Morris Machine Tool Co.**, Cincinnati.

Notch Sensitivity

AT HIGH TEMPERATURES Evaluated

 **The Iron Age**
FOUNDED 1855
Technical Articles



By **W. F. Brown, Jr.**
National Advisory Committee
for Aeronautics
Cleveland

and

George Sachs
Vice-President
Horizons, Inc.
Cleveland



An NACA survey shows that at short times to rupture, strength of notched low alloy bolting and boiler steels at 932°F exceeds that of unnotched bars. The amount depends primarily on depth of notch. With increasing time to rupture, notched strength falls well below unnotched specimens—until 30,000 hr is reached, when notched bars may recover. Low original ductility means low notch strength. Heat treating to raise creep strength increases notch sensitivity.

Stress concentrations introduced by notches such as threads, holes, shoulders and splines have already been shown to have a pronounced influence on the behavior of some metals at room temperatures¹. Therefore, it is important to investigate their effect in high temperatures, particularly under long-time loading.

It was recognized over 25 years ago that boiler flange bolts often broke in the threads after several thousands of hours at temperatures between 750° and 1000°F. The significance of these observations of the notch effect in creep loading was apparently not recognized until much later. The majority of research work on this important subject was carried out in Germany and Switzerland in the last 10 to 12 years. The materials investigated were heat-resisting, low and medium alloy steels with high creep strength. The Germans were using them during World War II in many applications where stainless steels would normally be applied in the United States.

A critical and detailed survey of these data was recently undertaken and published by the National Advisory Committee for Aeronautics². This article is based on the survey.

Notch rupture and unnotched rupture strength data for several low alloy bolting and boiler steels are shown in Figs. 1, 2, and 3. All tests were carried out at 932°F and in most cases covered time periods up to 10,000 hr. The notch specimens employed are illustrated.

In all cases, the notch stress-rupture strength

at short times to rupture exceeds the strength for an unnotched bar by an amount depending primarily on the depth of the notch. With increase in rupture times, two distinct classes of behavior are observed at this temperature:

(1) The strength of the notched bar remains above that of the unnotched specimen, as is characteristic of ferritic stainless steels³ of the type shown in Fig. 1, or it may gradually approach and eventually be the same as the unnotched strength. The latter behavior is typical of chrome-moly steels^{3, 4}, and also of a variety of nickel-free annealed boiler steels⁵.

(2) The strength of the notched bar decreases rapidly with increasing time to rupture and falls well below the strength of the unnotched specimen. This notch-sensitive behavior is typical for Cr-Ni-Mo steels^{3, 4, 6}, Figs. 2 and 3. If the tests extend to very long periods of time, over 30,000 hr, the notch strength, Fig. 3, may recover and become equal to or possibly greater than the strength of the unnotched bar.

Further data⁷ give the ratio between the notch strength and the unnotched strength at 10,000 hr to rupture for a variety of heat-resisting steels tested at 932°F. These data have been assembled in the accompanying table and the ductilities have been added where available.

From Figs. 1 and 2 and the table, it is apparent that the strength behavior is related to the unnotched ductility. If this ductility is above approximately 10 pct, the notch strength is equal to or greater than the unnotched strength,

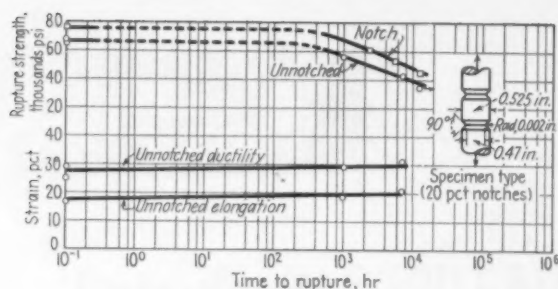


FIG. 1—Stress-rupture characteristics at 932°F for notched and unnotched chromium steel (0.1 C, 20 Cr, 1.0 Mo, 0.35 Si). Heat treatment: 1382°F to 1472°F, air cooled.

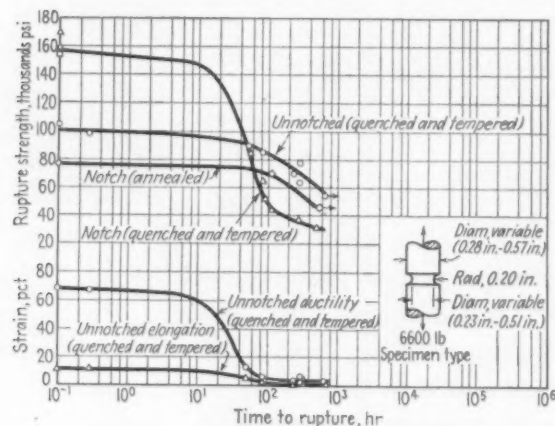


FIG. 2—Stress-rupture characteristics at 932°F for notched and unnotched Cr-Ni-Mo steel (0.12 C, 0.7 Cr, 1.6 Ni, 0.8 Mo). Notch behavior is typical for such steels.

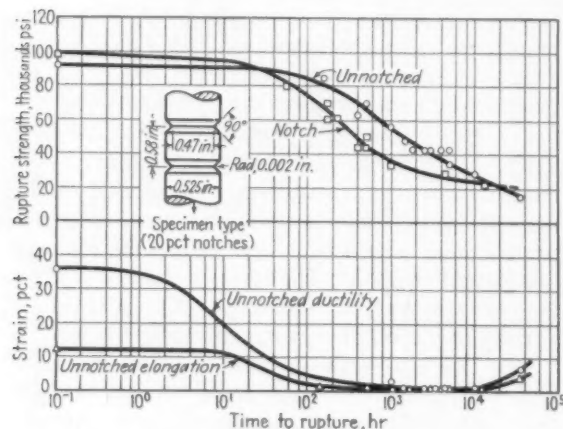


FIG. 3—Stress-rupture characteristics at 932°F for notched and unnotched specimens of Cr-Ni-Mo steel (0.11 C, 0.7 Cr, 1.5 Ni, 0.88 Mo, 0.22 Si). Heat treatment: 1598°F, oil quenched and 1112°F air cooled.

High-heat notch resistance (continued)

that is, the notch rupture strength ratio is greater than unity. For ductility values less than 2 or 3 pct, the notch weakens the steel.

Where the steel is notch sensitive, Figs. 2 and 3, the trend of the notch rupture strength closely parallels that of the unnotched ductility. It falls rapidly in a restricted range of rupture times. The recovery in ductility at very long

times to rupture, Fig. 3, is then associated with a recovery of the notch rupture strength.

The previously discussed data for low-alloy steels constitute the only published notch stress-rupture results which clearly reveal the influence of unnotched ductility. A few data have been reported, however, for lead cable sheathing⁸. This data further supports the important influence of ductility in determining the notch sensitivity.

As shown in Fig. 4, tests were made on bars of rectangular cross section with "V" notches cut in the width direction. Unfortunately, the only elongation values for these sheath materials were at room temperature. However, they have been included for purposes of comparison in Fig. 4B. According to the data presented by Moore and Dollins⁸, it would be expected that an increase in temperature would generally reduce elongation.

The notch rupture strength, Fig. 4B, of the calcium lead is approximately 20 pct below the strength values for the unnotched bars over the entire range of rupture times investigated.

Conversely, the chemical lead is strengthened by notching within approximately the same range of times to rupture. An examination of the corresponding elongations confirms the previous conclusion regarding the effects of ductility.

Notching weakens some "super alloys"

A few tests have been made⁹ on several alloys corresponding to British and American gas turbine alloys. These are discussed in detail in the full NACA survey². While the data are quite meager it is indicated that several of the "super alloys" may be weakened by notching. This is at a test temperature of 1300°F and at rupture times between 1000 and 5000 hr. Siegfried⁹ also mentions model tests on full-scale turbine blade roots of the "fir-tree" type. Tests of this type reveal that the mode of failure is primarily dependent on temperature.

Some tentative conclusions are permissible regarding the general effects of alloy composition and heat treatment on the notch stress-rupture characteristics of low-alloy steels. Apparently the Cr-Ni-Mo^{3, 4, 6} steels containing from 0.7 to 0.8 Cr, or 0.9 to 1.5 Ni, and up to 1.0 Mo are extremely notch sensitive in stress-rupture tests at 932°F. This is true both in the quenched and tempered and in the normalized condition. The elimination of nickel results in lower creep strengths but greatly reduces the notch sensitivity. Further information regarding the effects of composition and heat treatment is given by Thum and Richard⁷. This is for a large number of Cr-Mo steels containing various other alloying additions. Data are shown for only one fracture time, 10,000 hr, and one temperature, 932°F. In general, these data confirm the previous conclusion regarding the deleteri-

CREEP AND STRESS RUPTURE PROPERTIES OF VARIOUS STEELS⁷

Chemical Composition					Heat Treatment, °F	Creep Strength, 1000 psi	Unnotched Strength, 1000 psi	Rupture Reduction, Area in pct	Notch-rupture Strength Ratio
C	Ni	Cr	Mo	Other					
0.19	...	0.99	0.38	...	1852°, Air; 1186°, air	23.5	34	13	0.96
0.14	0.00	0.85	0.86	...	1742°, oil; 1220°, water	38.5	35.5	0.2	0.48
0.32	...	0.99	0.26	...	1532°, water; 1130°, air	23	21	...	1.13
0.25	0.03	1.13	1.11	...	1736°, air; 1181°, air	37	35.5	8	0.86
0.11	1.53	0.72	0.88	...	1598°, oil; 1094°, air	46	30	1	0.79
0.14	1.20	0.81	1.01	...	1539°, oil; 1094°, water	34	34	3	0.54
0.18	1.48	0.87	1.03	...	1736°, air; 1130°, air	44	32.5	1	0.68
0.20	0.91	0.78	0.94	...	1742°, air; 1148°, air	51	32	1	0.65
0.11	...	0.90	1.00	0.9 V	1742°, water; 1236°, water	40	38.5	1.8	0.57
0.21	0.12	1.10	0.68	0.07 V	1599°, oil; 1310°, air	37	28	> 83	1.12
0.21	...	1.00	1.01	0.07 V	1742°, oil; 1292°, air	57	32.5	11.5	0.88
0.21	...	1.00	1.01	0.07 V	1742°, air; 1292°, air	57	41	5	0.76
0.22	...	1.62	0.43	0.39 V	1742°, oil; 1274°, air	50	33	6	1.06
0.30	0.20	1.61	1.29	0.1 V	1742°, air; 1255°, air	44	35.5	37	1.00
0.31	0.15	2.55	0.28	0.48 V	1852°, water; 1112°, air	27	27	> 60	1.00
0.21	0.24	1.10	0.77	0.2 V, 0.82 Si	1599°, oil; 1255°, air	45.5	38.5	90	1.07
0.22	0.02	1.11	1.30	0.2 V, 1.02 Si	1598°, oil; 1184°, air	50	36	...	1.10
0.19	0.21	2.71	0.51	0.74 V, 0.94 W	1940°, air; 1256°, air	50	50	3	0.69
0.21	...	1.65	0.45	0.7 V, 0.56 W	1922°, oil; 1922°, water	45.5	51	...	0.56
0.10	...	19	1.0	...	1427°, air	32.5	40	62	1.25
0.10	8.4	18	...	0.67 Ti	1896°, water	23	45.5	...	1.09

ous effect of nickel in the amounts mentioned. Data are also presented for Cr-Mo steels with 1 to 2.5 Cr and 0.3 to 1.3 Mo, plus various small amounts of nickel, silicon, vanadium, and tungsten. These steels were quenched from 1742°R, tempered at 1112°F to 1292°F and air cooled. The presence of up to 0.2 Ni did not result in notch sensitivity for compositions containing 0.1 to 0.2 V. The addition of 0.8 to 1.0 Si appears to improve notch properties considerably.

The effect of annealing and spheroidizing on the notch and unnotched rupture strength is shown by Richard⁴ and by Siebel and Wellinger⁶. The notch rupture strength is shown in Fig. 2 for an annealed steel. When these data are compared with those for the same steel in the quenched and tempered condition, the annealed structure exhibits a considerably lower rupture strength at short times to rupture. The notch strength of the presumably more ductile

annealed conditions, however, changes much less with increasing rupture time. It is approximately 50 pct higher than that of the quenched and tempered steel at 500 hr.

The Cr-Ni-Mo steel in Fig. 3 was also investigated in the spheroidized condition, Fig. 5. This was produced by tempering an oil quenched specimen for 500 hr at 1256°F. The elongation of this structure is much higher than the quenched and tempered alloy (compare Figs. 3 and 5) and rises with increasing time to rupture. The notch rupture strength of the spheroidized steel is consistently higher than the unnotched strength for all rupture times investigated.

Both the quenched and tempered and the normalized and stress-relieved structures of Cr-Ni-Mo steel are notch sensitive. From the data available it is impossible to distinguish between these types of heat treatment regarding

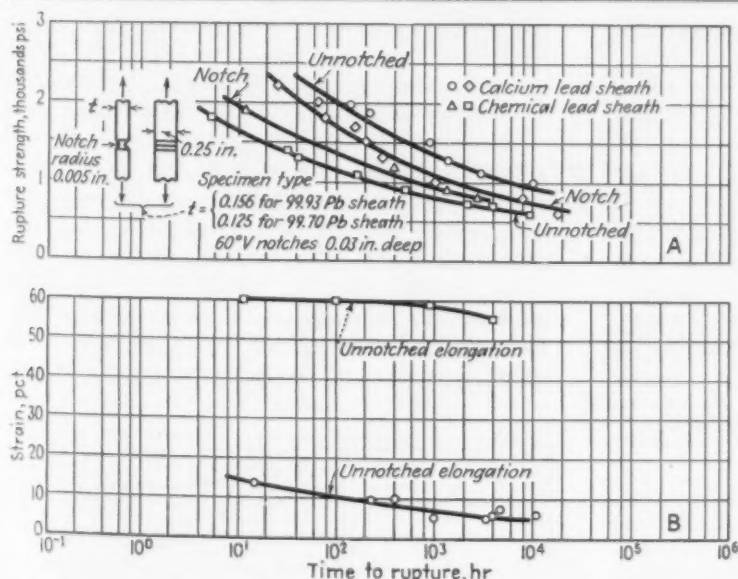


FIG. 4—Notched and unnotched stress-rupture characteristics of two commercial lead cable sheathing alloys. Calcium lead sheath, 99.7 Pb; chemical lead sheath, 99.93 Pb. Curves shown in "A" are results of tests at 110°F, those in "B" of tests at room temperature.

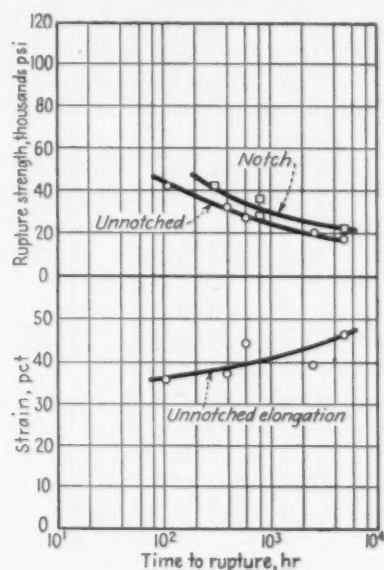


FIG. 5—Spheroidized Cr-Ni-Mo steel (0.11 C, 0.7 Cr, 1.5 Ni, 0.88 Mo, 0.22 Si) at 932°F. Treatment: 1598°F, oil quenched, tempered 500 hr 1256°F.

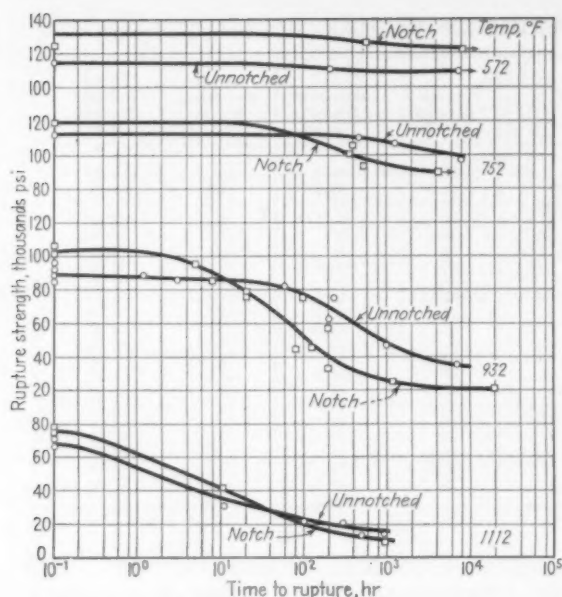


FIG. 6—Rupture strength of Cr-Ni-Mo steel (0.20, 0.8 Cr, 0.9 Ni, 0.48 Si, 0.9 Mo) at various temperatures. Heat treatment: normalized at 1742°F, stress relieved 1148°F.

High-heat notch resistance (continued)

their effect on the notch sensitivity. For the previously mentioned group of Cr-Mo steels⁷, containing small quantities of nickel, vanadium, silicon and tungsten, notch sensitivity is more pronounced if the quenching temperature is increased to 1868°F. Also, Cr-Mo steels of this group containing additions of 0.7 V and from 0.35 to 0.50 W are notch sensitive if quenched from temperatures near 1900°F. In general, heat treatments designed to yield high creep strengths increase notch sensitivity.

Examination of the data revealed several important phenomena which may clarify the mechanism of stress-rupture embrittlement and notch sensitivity in low alloy steels.

(1) The unnotched ductility and the notch strength pass through a minimum at long times to rupture, Fig. 3.

(2) Annealed and spheroidized steels are not notch sensitive, Figs. 3 and 5.

(3) Influence on the room-temperature impact strength of heating at 932°F for various times up to 9000 hr is given³ for several low-alloy steels. Brittle Cr-Ni-Mo steels of the type shown in Fig. 3 exhibit a distinct minimum in impact strength at 5000 hr. In contrast, the impact properties of a Cr-No-V steel, ductile in stress-rupture tests, remain practically constant with increased heating time.

(4) Low-alloy steel specimens held at a constant load at 932°F for various lengths of time⁸ reveal a progressive loss of room temperature impact strength with increasing time under load. This damage is most pronounced for the brittle Cr-Ni-Mo steels. It can be partly recovered by a reheat treatment of the creep specimens.

May be a precipitation reaction

These phenomena point to time-dependent and reversible structural changes. They are primarily responsible for the stress-rupture embrittlement and consequent notch sensitivity in low-alloy steels. Such a change could be a precipitation reaction.

To study the problem as a precipitation reaction, the relative effects of both time and temperature on the notch rupture sensitivity must be known. Data which would reveal this are very meager. However, notch and unnotched stress-rupture tests are reported³ for a Cr-Ni-Mo steel at several temperatures.

A conventional plot of these data is shown in Fig. 6. From the curves in Fig. 6, the notch rupture strength ratios have been plotted in Fig. 7. This was done to indicate more clearly the effects of temperature.

Exact nature of precipitate unknown

If a precipitation reaction is responsible for the stress-rupture embrittlement of low-alloy steels, the exact nature of the precipitate cannot be stated on the basis of the evidence published. Loss of impact energy in specimens heated for various lengths of time between 900° and 1000°F has already been associated with the type of precipitation thought to cause temper brittleness. However, it must be remembered that these steels contain molybdenum well in excess of the amount believed to be sufficient to eliminate temper brittleness in the ordinary sense¹⁰.

The only rupture texts which clearly reveal the influence of notch geometry are for 9 tin-6 cadmium¹¹. These tests show that notch depth has negligible effect for depths between 36 and 58 pct. The data for this alloy have been replotted, Fig. 8. This provides the variation of the notch rupture strength ratio with notch sharpness for two times to rupture. For comparison, curves for room temperature notch tensile tests on an SAE 3140 steel¹² have been added.

The curve in Fig. 8 for the steel with a 190,000-psi strength level is typical for a notch-ductile metal, which exhibits only the strengthening effect. The 100-hr notch rupture-strength ratio curve for the Sn-Cd alloy follows the same trend. In both cases an initial strengthening is indicated by an increase in the notch strength ratio with increasing notch sharpness up to a notch sharpness of approximately six. For the

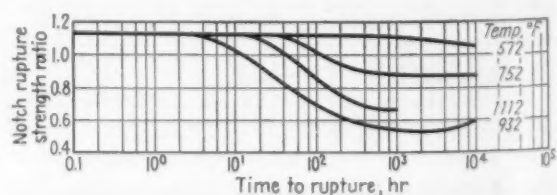


FIG. 7—Notch rupture strength ratio for Cr-Ni-Mo steel (0.2 C, 0.8 Cr, 0.9 Ni, 0.48 Si, 0.9 Mo) at various temperatures. Normalized at 1742°F, stress relieved at 1148°F.

higher notch sharpnesses, the notch strength ratio decrease only slightly.

Sharper notch reduces strength ratio

The case of a metal that is weakened by notching is illustrated in Fig. 8B. Curves are shown for 1000-hr notch-rupture tests on the Sn-Cd alloy and for notch-tensile tests on the SAE 3140 steel, heat-treated to a strength of 240,000 psi. At this high strength level, the SAE 3140 steel is notch-brittle. Weakening in either case is exhibited only if the notch sharpness exceeds a certain value. Below this point, the strengthening effect predominates. Higher notch sharpnesses, however, decrease the notch strength ratio rapidly. This decrease occurs at a rate that depends on the ductility under the conditions of notching.

An explanation of the trend of these curves in terms of the known facts regarding the stress and strain states in notched bars is given in the full NACA survey². However, the influences of notch geometry are essentially the same in rupture tests as in room temperature tensile tests.

The data presented here cover only a very restricted range of materials. The effects of the important temperature variables have not been at all thoroughly investigated.

It would seem that low alloy steels are weakened by notches when creep loaded if the unnotched ductility is less than 2 or 3 pct. However, whether ductilities higher than these values always mean freedom from notch sensitivity awaits further investigation. This statement can be based on the notch brittleness observed in tensile tests of presumably highly ductile low-alloy steels. It is further supported by some stress-rupture results presented by Smith, Seens and Dulis¹³ for a quenched and tempered, Cr-Ni-Mo-V steel. At 700°F, although the unnotched rupture ductility is always above 10 pct, thread failures were encountered.

A definite knowledge of the effects of notch geometry on the notch rupture strength of vari-

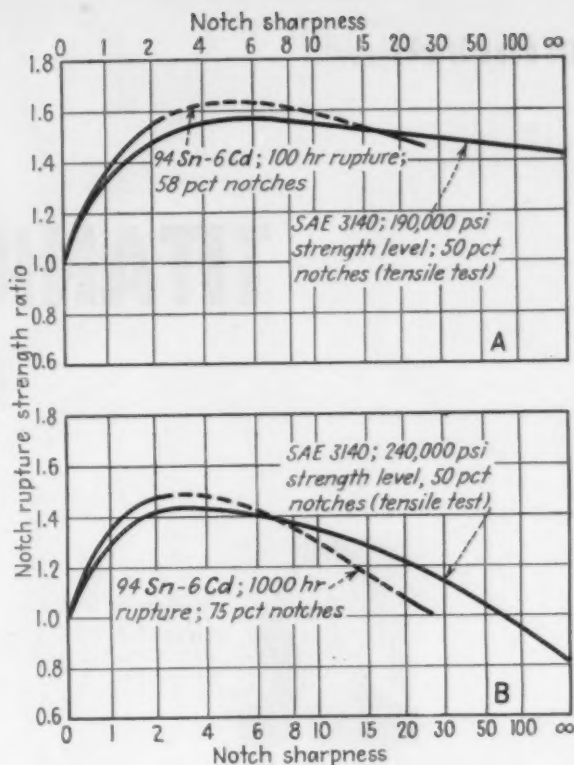


FIG. 8—How notch rupture strength ratio depends on notch sharpness in static tensile and rupture tests. In "A", results typical for notch ductile material are shown. In "B", results typical for notch brittle material.

ous types of alloy steel should be distinctly helpful to the designer concerned with fastening problems at elevated temperatures. It should be possible to develop design limits for notches of various sharpnesses.

The mechanism of stress-rupture embrittlement as influenced by composition and heat treatment requires further clarification. Investigations are needed to establish development of embrittlement as a function of time and temperature. The structural changes which may accompany such embrittlement must be determined.

References

- ¹ Sachs, G., Ebert, L. J., and Brown, W. F., Jr., "Comparison of Various Structural Alloy Steels by Means of the Static Notch-Bar Tensile Test," T. P. 2110, Metals Technique, Dec., Vol. 13, No. 8, 1946.
- ² Brown, W. F., Jr., and Sachs, George, "A Critical Review of Notch Sensitivity in Stress Rupture Tests," NACA TN 2433, Aug., 1951.
- ³ Thum, August and Richards, Kurt, "Brittleness and Damage of Heat-Resisting Steels in Creep," Archives für die Eisenhüttenwesen, July, Vol. 15, No. 1, p. 33, 1941.
- ⁴ Richards, K., "The Strength Behavior of Heat-Resisting Low Alloy Steels and Their Tendency to Brittle Failure," Archives Metallkunde, May, p. 157, Vol. 3, No. 5, 1949.
- ⁵ Thum, A., and Richards, K., "Creep Strength and Strain of Inter-changer Tube Steels," Mitteilungen der Vereinigung der Grosskesselbesitzer, June 15, p. 30, Vol. 86 and 87, 1942.
- ⁶ Siebel, Erich, and Wellinger, Karl, "Testing Steels for Brittleness at High Temperatures," Archives für die Eisenhüttenwesen, March, p. 387, Vol. 13, No. 9, 1940.
- ⁷ Thum, A., Richards, K., "Strength of Steels in Long-Time Loading," Mitteilungen der VGB, Dec. 31, p. 171, No. 85, 1941.
- ⁸ Moore, H. F., and Dollins, C. W., "Fracture and Ductility of Lead and Lead Alloys for Cable Sheathing," University of Illinois Bulletin, Oct. 19, Vol. 41, No. 9, 1943.
- ⁹ Siegfried, W., "Observations on Conducting and Evaluating Creep Tests," June, p. 189, Journal Iron and Steel Institute, Vol. 156, Pt. 2, 1947.
- ¹⁰ Hollomon, J. H., "Temper Brittleness," Transactions ASM, p. 473, Vol. 36, 1946.
- ¹¹ Siegfried, W., "Brittleness and Toughness of Metals at high temperatures," Schweizer Archives, Jan., p. 1, Vol. 11, No. 1 and p. 43, Vol. 11, No. 2, 1945.
- ¹² Sachs, George, Lubahn, J. D., and Ebert, L. J., "The Effects of Notches of Varying Depths on the Strength of Heat-Treated Low Alloy Steels," Transactions ASM, p. 517, Vol. 34, 1945.
- ¹³ Smith, G. V., Seens, W. B., and Dulis, E. J., "Hardened Alloy Steel for Service Up to 700°F," ASTM Preprint 1950.

Titanium does tricks—

TITANIUM

Aids Silver Brazing



By Arnold S. Rose

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Non-brazing qualities of titanium have proved helpful in silver soldering a type 321 stainless steel assembly in a fused potassium chloride-sodium chloride salt bath. Titanium strips around assembly act as dams and hold the silver solder in place. The salt bath operates at 1350°F. Rings must be replaced after 25 hr exposure to the corrosive salt bath.

Because of the refractory nature of its oxide, it has been impossible to braze titanium and its alloys using commercially available fluxes. Silver solder will not wet the titanium surface and displays a complete lack of bonding. This inability to braze to titanium has led to a successful application of titanium sheet metal in salt bath silver brazing of stainless steel.

An inner and outer flange and cylinder of type 321 stainless steel Fig. 1 are joined by silver solder in production quantities. The brazing process uses a molten salt bath of potassium-chloride sodium chloride mixture operating at 1350° F. Mating surfaces are pre-fluxed and a ring of silver solder placed on the upper ledge of the flange. Following a further addition

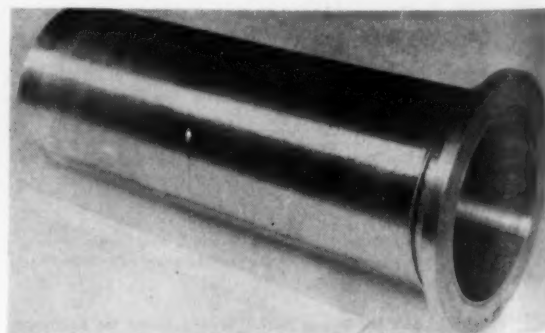
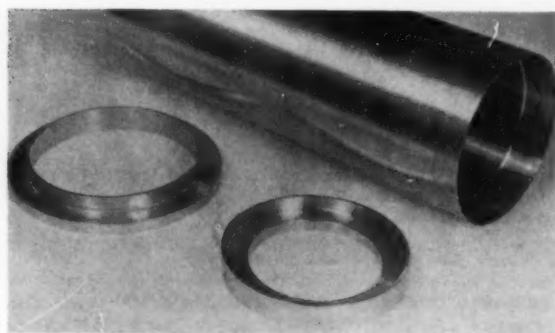


FIG. 1—Type 321 stainless steel tube and inner and outer flanges are shown before assembly, left. Right are assembled parts with silver solder in place ready for brazing. Parts quickly reach uniform temperature in salt bath.

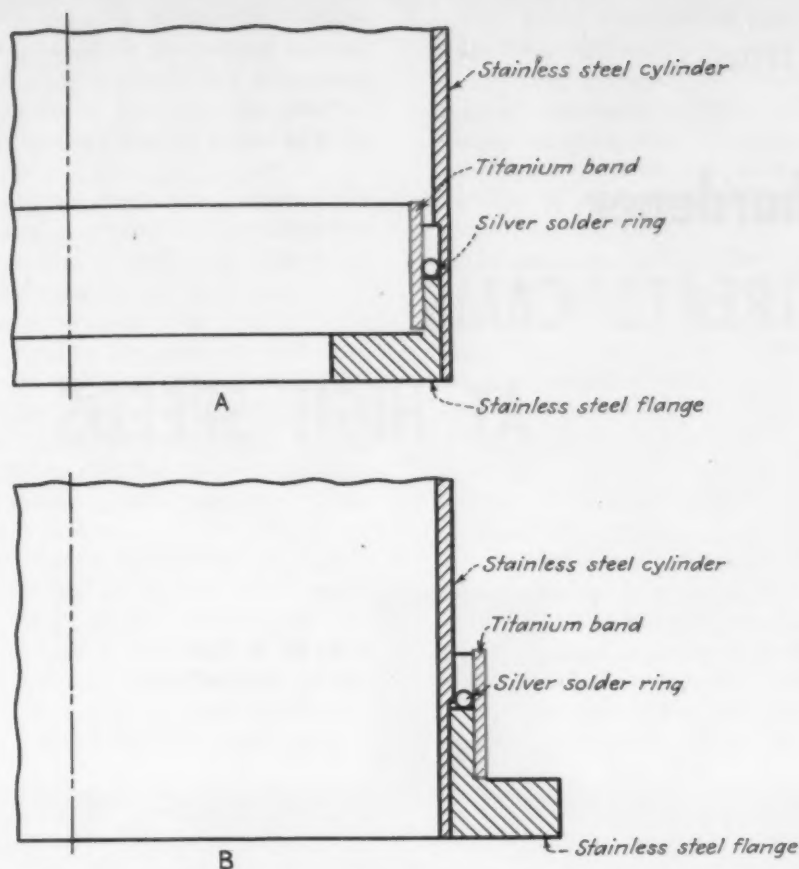


FIG. 2—Titanium dam ring proved answer to difficult silver brazing job. Rings hold solder in place while assembly is brazed in fused salt bath, are easily removed after brazing. Silver solder does not bond to titanium.

of flux, the part is dried to eliminate moisture in the flux and then immersed in molten salt.

The advantage of salt bath heating for brazing a joint of this sort is that parts quickly reach a uniform temperature—in this instance 5 min. is sufficient for brazing. A major disadvantage is that the solder ring, which has a higher thermal conductivity, is heated to its melting temperature considerably faster than the stainless steel parts being brazed.

Upon becoming molten and finding no receptive joint, a large portion of silver solder rolls off. Only an insufficient amount is left to provide alloy when the parent parts reach temperature. Solution of this problem proved difficult since the parts could not be redesigned. Preplaced silver solder shim stock or internal grooves for silver solder wire could not be used.

A temporary solution involved use of a stainless steel cylindrical sheet. This formed a reservoir to contain the molten silver solder until the stainless steel joint attained required brazing temperature. To prevent soldering of the stainless steel dam ring, it was oxidized by heating in air to 2000°F for about 15 min.

Further deterrent to wetting and possible brazing of the dam to the parts was provided by a coating of magnesium oxide powder. This was applied over the oxidized surface prior to as-

sembly. Placement of the dam rings, silver solder and flanges is shown in Fig. 2.

This method proved only partially successful. In spite of precautions, the removal frequently involved destruction of the dam and occasional damage to the cylinder assembly. To meet this problem a set of titanium rings for brazing both inner and outer flanges was designed. Rc 70 titanium strips, 1-in. wide x 0.062-in. thick, were rolled and made into rings of required diameter. The ends were inert-arc butt-welded under an argon atmosphere. To facilitate removal of the inner ring after the brazing operation, several holes were drilled around the ring into which removal hooks could be inserted. The outer titanium ring was readily accessible and could be removed by prying gently.

Service life of the titanium is limited only by the corrosive effects of the molten chlorides in the salt bath. Pitting first becomes noticeable after about 1 hr immersion at the 1350°F brazing temperature. After 25 hr of exposure to the bath, the corrosion is so severe that replacement of the bands is necessary. Inasmuch as the bath affords protection from the air at elevated temperatures, no embrittlement caused by nitrogen or oxygen is noted. Similar use of titanium could probably be made with oven or induction brazing.

Auto cams hardened faster—

Flame hardener TREATS CAMS AT HIGH SPEEDS



By W. G. Patton
Asst. Technical Editor

Automatic transmission cams are being flame-hardened at close to 550 pieces per hr on an automatic machine at Buick Motor Div. After loading, operator starts automatic hardening cycle. Oxygen-propane flame brings cams to heat. Parts are dropped into oil quench, then conveyed out of machine and deposited in tote pans.

A 3-spindle automatic oxygen-propane flame-hardening machine at Buick Motor Div. is simultaneously hardening six and eight internal lobes of three different automatic transmission cams at the rate of nearly 550 parts per hr.

A simple loading fixture permits one operator to load the parts with minimum physical effort. The heating cycle functions automatically after the part is loaded in the fixture and the operator pushes a button to start the cycle.

After flame treatment cams are deposited in an oil quench inside the machine. Parts are delivered from the quench by a woven wire belt conveyer. Continuous longitudinal guides on the conveyer belt and the arrangement of stripper rings on the work-holding spindles make it pos-

sible for each of three sizes of cams to be placed in the separate lanes of the conveyer. Each size of cam is deposited at the take-off end of the conveyer into separate tote pans.

Since only one machine is required to handle three different cams, considerable floor space is saved. In addition, the number of rejects has been reduced as compared with the hardening method previously employed.

The unusual flexibility of the installation is accomplished by making each heating unit function independently. Surface temperature of the part is controlled within $\pm 5^\circ$ F through an electronic system.

Precise control of the hardening operation in the Cincinnati Flamatic hardening machine

is achieved by the use of a thermopile. Focused on the work, this sensitive instrument controls the heating cycle. The necessity for fast-acting controls is indicated by the fact that surface temperatures of the cams may be raised as much as 500° F in 1 sec.

Three different size cams are required for various Buick cars. The over-riding clutch cam has six lobes; another transmission cam hardened on the same machine has eight lobes.

Internal recesses of each cam ring must be hardened while leaving the adjacent area soft. Hardness must be sufficient to withstand the high pressure of over-riding clutch rollers. Where holes are drilled at right angles to cam face, high ductility is required to avoid cracking surface. Heating time ranges from 9 to 12 sec, loading requires 3 to 4 sec.

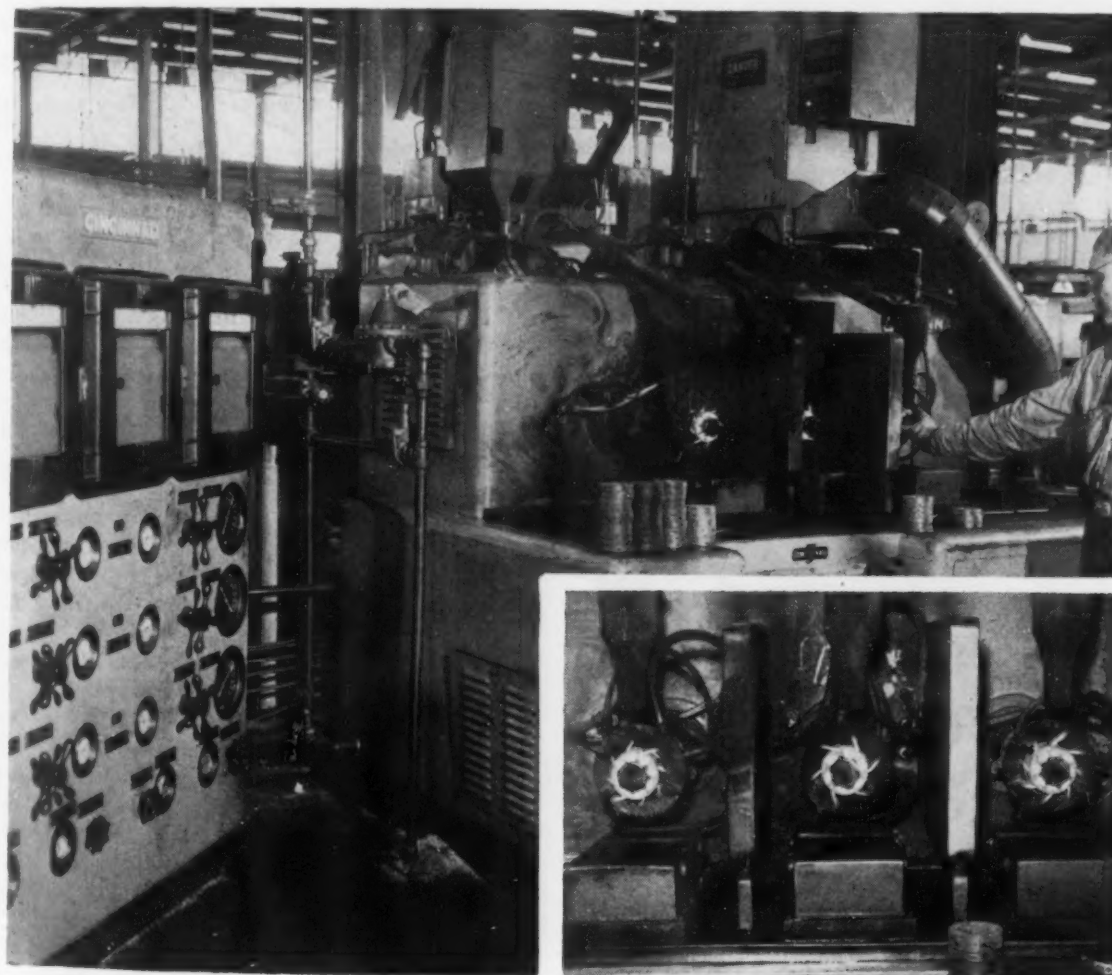
Gas is supplied from outdoor tanks. A stationary tank holds 1000 gal of propane. Two trailer units carry 20,000 cu ft of oxygen each. Approximately 1/4 cu ft of propane and 3/4 cu ft of oxygen are required per cam. The ratio of one part propane to three parts oxygen produces a reducing flame so that little or no scale results.

The steels specified for this application include SAE 1062 and 4063. During recent months it has been necessary to switch to other alloy grades. Preliminary tests indicate that the change in alloy steel compositions will be accomplished without too much difficulty. The machine is adaptable for nearly all types of alloy or carbon steel.

The hardness pattern for the cams must be closely held. The production on a repetitive basis of a definite hardness pattern depends upon the precise control of work surface temperature obtained with the electronically-operated temperature control instrument.

The hardened surface of the cam lobe measures 63 1/2 RC at a distance 0.015 below the surface. A hardness of 60 RC is developed 0.080 in. below the surface.

Operating experience shows that selected surfaces hardened by this method have minimum distortion. The practice of combining machine tools with heat treating tools at Buick has resulted in higher production with lower capital investment, less labor and maintenance costs and increased output per sq ft of floor space.



FLAME HARDENER at Buick Motor Div. handles heat treatment of transmission cams at close to 550 pieces per hr. After loading, machine cycle is automatic. Parts fall into oil quench, are conveyed to tote boxes. INSET—Oxygen-propane gas provides heat for hardening treatment.

Bazookas on the merry-go-round—

Bazooka rocket motor testing

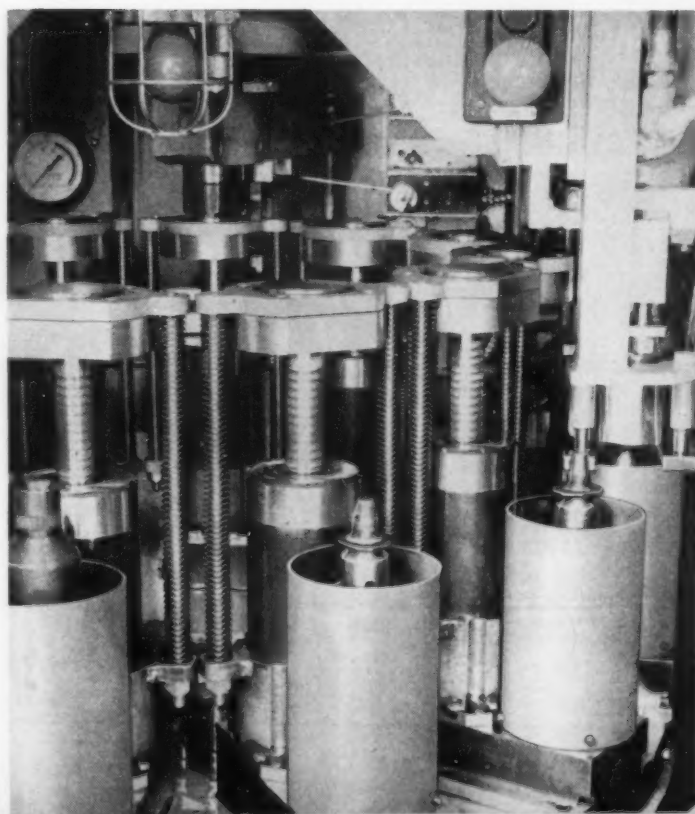
NOW FULLY AUTOMATIC



By H. E. Stein
Development engineer
Denison Engineering Co.
Columbus, Ohio

A standard, 15-ton capacity, 12-station rotary press has been especially tooled so that one operator can test 600 3.5 in. rocket motors an hour, at pressures up to 25,000 psi. Safety controls, wrenching, testing, stamping of satisfactory parts and rejection of failures are all completely automatic.

CLOSE-UP of rotary, 12-station testing machine. Rocket motor body may be seen in station at left, ready to be removed. At right are two empty stations and beyond them is a rocket motor being "wrenched-in."



The need for adequate anti-tank ammunition at the outbreak of the Korean conflict placed the production of the now famous 3.5-in. rocket high on the priority list. This larger rocket, replacing the 2.36-in. type called for new and faster testing, along with improvements in production methods.

Such high-powered rockets must be internally tested prior to assembly, at pressures to 25,000 psi. Major tests include those of the rocket motor body and the closure plug, to which the war head of the rocket is threaded.

Although temporary equipment was immediately put into operation, the search for improved methods began. One of the first of the improved machines is already in operation at McKeesport, Pa., in the Christy Park Works of National Tube Div., U. S. Steel Co., McKeesport, Pa., in the Christy Park Works of National Tube Div., U. S. Steel Co. Similar equipment is, or soon will be installed in other production lines devoted to this critical munitions items.

The hydraulic "Multipress", a product of the Denison Engineering Co., Columbus, Ohio, was chosen for the basic machine. It is equipped with a rotary index table hydraulically powered by a fluid motor, interlocked with the hydraulic

system of the press. The index table is a Geneva-driven, 12-station type.

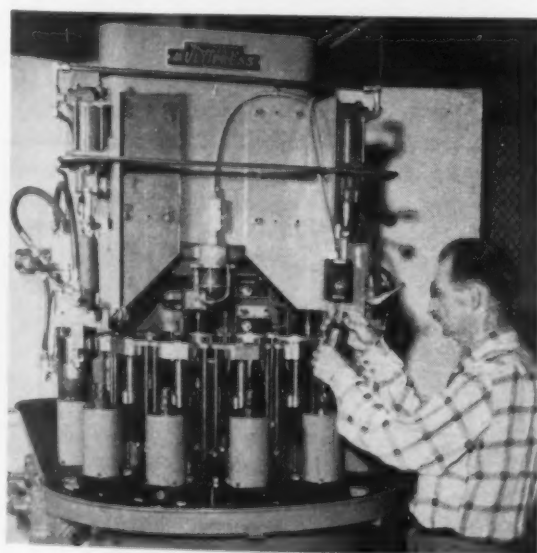
The first test machine was made for the motor body. Each fixture was designed as an individual intensifier unit amplifying approximately ten times the force brought to bear by the main press ram. A 15-ton capacity press operating at 2500 psi therefore produces 25,000 psi internal pressure within each motor body. The press ram descends, actuating the inner plunger of the intensifier. This gives each part a 2-sec test.

Methods used prior to this time produced approximately 100 tests per hr. These were more or less emergency devices rigged to handle the testing until something better could be obtained. Each motor body had to be threaded onto the fixture, air expelled from the intensifier fixture, tested at the required pressure, stamped with an inspection mark and then removed from the fixture. Manually accomplished, the job was a time-consuming affair requiring six to seven workers for each machine.

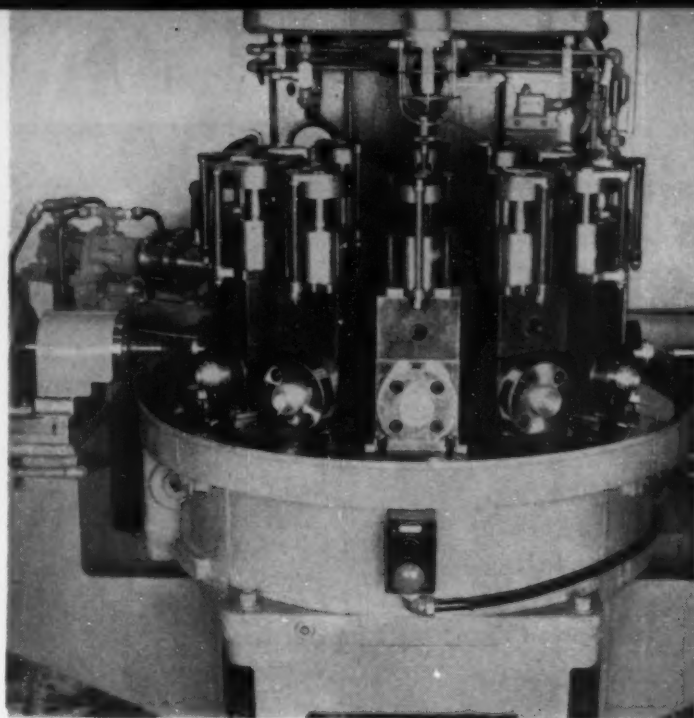
The new machines provide completely automatic operation except for the initial placement of the part in the fixture and its removal. The "wrenching-in" operation is achieved by the use of a fluid motor drive which powers a torque wrench, consisting of an hydraulically powered expanding collet. The torque wrench is moved up and down automatically.

At the next station, the fixture is filled with oil, purging air from the fixture for the testing operation. Here again, the filling valve is automatically opened as the filling device is lowered to the top of the fixture.

The index table then revolves to the station directly beneath the press ram and the intensi-



SINGLE OPERATOR can test 600 3.5-in. "bazooka" rocket motor bodies an hour with this equipment, at pressures up to 25,000 psi. Unit can be easily retooled for either new rocket types or design changes.



SAME BASIC PRESS is being used here to test closure plugs for the 3.5-in. rocket motor. Parts are mounted horizontally in this case, "wrenched-in" by fluid-driven collets.

fier plunger is depressed by the ram. When the plunger is fully depressed, an electric time-delay circuit effects a 2-sec dwell. If the part proves satisfactory, the inspection punch, cocked mechanically and automatically released by a solenoid, stamps the part as approved. If the part fails, the pressure is relieved as the defective motor body releases oil. The plunger contacts an electrical switch that automatically opens the circuit, stopping the press and causing a warning light in front of the press to light.

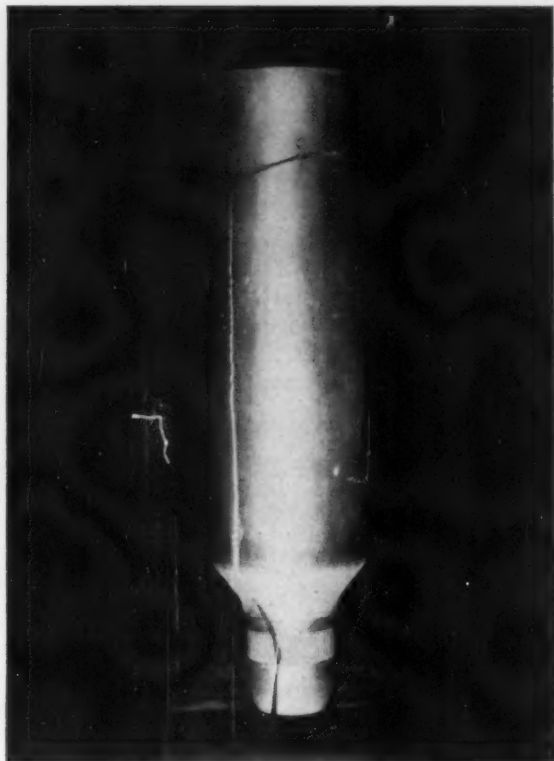
This automatic safety feature locks the electrical circuit of the press. This can be opened only through the use of a key retained by the responsible ordnance inspector. Since defective parts are handled only by this inspector, carelessness in disposing of them is almost completely eliminated.

Proper wrenching assured

In addition to the safety control which automatically spots defective parts, another device assures proper wrenching action as the part is positioned for testing. If the adaptor plug does not thread into the fixture properly, the press is instantly stopped. If this plug were not securely seated, it could be blown from the fixture with violent force.

This safety device consists of a limit switch controlling the electrical circuit of the press motor. It is placed so that if the part is fully turned into the fixture, it will clear the switch. If the plug is not threaded properly, the limit switch is actuated. This opens the circuit and stops the press. The operator can manually correct this condition when it occurs.

Tested parts are automatically de-wrenched at the last station. The operator need turn the



DEFECTIVE motor body shown after 25,000 psi test. Machine is automatically stopped and locked when such a failure occurs, and the part can only be removed by the authorized inspector, with his special key.

part by hand only a thread or two to remove it from the fixture. With one operator, the new machine tests over 600 parts per hr.

In the test just described, only the plain section of the body is tested, using lubricating oil

as the testing medium. Another test subjects the internal threaded section of the motor body to a 14,000 psi test. Soluble oil and water is used, providing an even more critical inspection of the threaded section.

In a similar set up, the closure plugs are tested. The closure plug is the connecting element between motor body and the war head. It must withstand a hydrostatic testing pressure of 18,000 psi.

The operation parallels that of the motor body in that torque wrenching, filling the fixture with oil, testing, marking with the inspection stamp and de-wrenching are all handled automatically. Again the operator is required only to remove the tested part and start the threads of the part to be tested.

Time, costs, space, manpower reduced

This unit is also a 10-ton capacity Multipress equipped with a hydraulically driven and controlled index table. The plug is threaded into the side of the fixture and positioned for the testing operation by a fluid motor-driven expanding collet.

Every specification set up by the Ordnance Corps has been met in this new equipment and the savings in production time, equipment cost, floor space and manpower more than justify its use.

The basic power medium and interlocked control system is standard with this type equipment. This means that if the parts being tested are made obsolete in the future, only the tooling is scrapped.

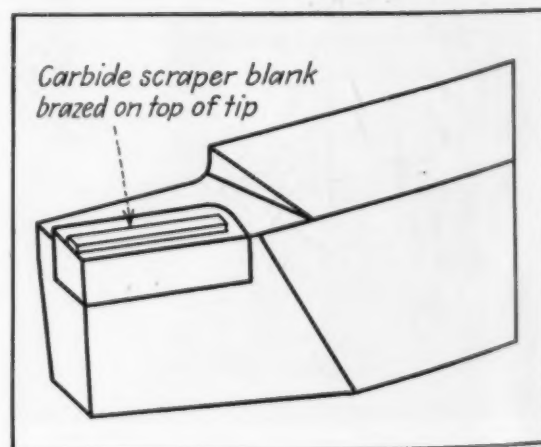
Similar developments in testing equipment of this type are underway for use in the production of other rockets and their components.

No diamond grinding with brazed chipbreaker

Conservation of diamond wheels can be helped through use of brazed-on carbide chipbreakers. As a substitute for ground chipbreakers, this type has been found to give satisfactory service.

In one shop which needed chipbreakers on some tools but had no suitable grinder, a carbide tip worn thin in long service was brazed on and proved satisfactory. Since then, other shops have taken up the idea as a means of conservation during the present diamond wheel shortage. Rather than looking for scraps of suitable size, Kennametal scraper blanks are frequently used.

Any shop equipped with a brazing torch, brazing material, and borax flux can easily attach its own chipbreakers. To aid in positioning the scraper blank during brazing, a piece of graphite can be used. It has an offset milled to desired chipbreaker width.



SCRAPER BLANK or other carbide piece of suitable size can be brazed on to a carbide cutting tip to make a chipbreaker. No grinding on diamond wheel is needed.

Four ways around the diamond shortage—

NEW MACHINING TECHNIQUES EVALUATED



By George Elwers
Machinery Editor

Four new machining and grinding processes have been evaluated by the National Research Council. Electrolytic, electro-arc, electro-sparking, and ultrasonic processes show promise for such applications as carbide tool grinding, titanium jet engine disc machining, and rifling gun barrels. Since the eight applications analyzed all require or might require diamond wheel grinding, these new processes seem like the answer to the growing diamond bort shortage. Two are in commercial use.

A way out of the worsening industrial diamond bort shortages is shown by an evaluation of four new processes for grinding sintered carbides. The electrolytic electro-sparking, electro-arc, and ultrasonic processes, singly or in combination, eliminate the need for diamond grinding in some cases, and drastically reduce wheel consumption in others. The processes also show promise for forming and finishing other hard-to-machine materials besides carbides.

An evaluation of the potentials of the new processes has been made for the Defense Dept. by a special panel of the National Academy of Sciences—National Research Council. Eight specific important operations, where new processes for machining and grinding may be needed have been considered. For each of these operations, at least one of the new processes appears to offer possibilities. For shaping and finishing dies, two of the processes are already in commercial use. Table I summarizes the status and potentials of the processes for the eight operations, as reported by the panel.

The importance of each operation in terms of consumption of diamond bort is also shown in Table I. Diamond bort has been essential in shaping, finishing, and sharpening cemented carbide for use. But the shortage of diamond bort appears to be worsening, with no relief in sight. In 1951, consumption of bort exceeded supply by 500,000 carats. Expected increases in supply from the mines failed to materialize and in the opinion of the National Production Authority, cannot be counted on in the future. Reclamation of diamond bort increased in 1951, but further large increases seem unlikely.

Added to this gloomy picture is the possibility of huge use of carbides in defense applications. Carbide projectile cores are now in limited production, and carbide jet engine turbine blades are in the experimental stage. But either use could grow to the point where there are not enough diamonds in the world to grind all the pieces that would be made. Should these applications prove desirable, an alternative to diamond grinding would be essential.

One of the most promising of the new proc-

New machining techniques (continued)

esses is electrolytic grinding. In this process the grinding wheel can be simply a metal disc, rotated very close to the workpiece but not touching it. An electrolytic cell is formed with the wheel as the cathode, the work as the anode, and an electrolyte supplied in the same manner as coolant is now applied in grinding. Local heating of the workpiece is low, and the cathode is not consumed. The process seems especially suited for removing stock from large surface areas. Its application for small surfaces or small, deep hole drilling, seems limited.

The second new method, electro-sparking, is already in commercial use. The workpiece is one of the electrodes in an electric circuit; a properly shaped electrode in the other. Between the two, a rapid series of sparks or arcs is formed, in a non-conducting fluid. The electrode is consumed at a relatively high rate. The sparks cause a mechanical separation of particles from the work surface. Since metal removal is mechanical and takes place in a bath of fluid, there is no local heating.

Best suited for holes

This method is particularly suited for forming holes relatively small in diameter and deep, of any shape.

Electro-arcng is also an electro-mechanical process for removing metal. In this case, an arc is struck and maintained between the electrode and the work, using direct current and a moderately conducting fluid. The work is the anode, and the cathode, a shaped electrode, is consumed slowly.

The special application of this method is cut-off, for hard metals and carbides. In pure electro-arcng, somewhat rough finishes are obtained.

Used in commercial machines

There has been much publicity on certain electro-mechanical machining processes such as Method X and Elox. Most of these, when designed for actual shaping operations and not simply broken tap removal, are of the electro-sparking class. Others appear to have characteristics of both the electro-sparking and electro-arcng class. None of these machines is widely available commercially yet. They are presently being produced in limited quantities for evaluation in various applications.

The three processes described above use electric current directly to obtain their action, and require workpieces which conduct electricity. Therefore they can't be used for most ceramics. In the ultrasonic process, it is abrasive action which removes the metal.

The finely-divided abrasive is fed in a liquid medium between the tool and the work. The rubbing action is gained by vibrating the tool

rapidly. Vibration frequency is as high as 29,000 cycles per second. Amplitude is low; only a few thousandths of an inch. The abrasive is ordinarily relatively low-cost 280-grit boron carbide. The tool is consumed in the process.

The largest single consumer of diamond bort is for diamond grinding of single-point tools consisting of carbide tips on steel shanks. Though the shank is ground separately with aluminum oxide wheels, the tip requires diamond grinding. This is usually a flat offhand grinding operation, although machine grinding can be used. The effective area of grinding is usually small, and the depth is also small.

Sharp edges, good finish required

The specifications for such work usually require that no cracks be visible at 200X magnification, and that surface finish be better than 50 micro inches rms. Sharp edges are important.

Where tool grinding is limited to offhand work, only the electrolytic method, or combinations of electrolytic and abrasive grinding, show promise. Conventional grinding machines with metal-bonded diamond wheels can be converted through addition of electrical equipment and electrolyte handling facilities. Such conversions are being made, the machines to operate in sharpening single point tools by a combination of abrasive and electrolytic grinding. The electrolytic method produces no cracks and a fine surface finish. Its ability to produce sharp edges has not as yet, however, been fully evaluated.

With machine grinding, the electro-sparking and ultrasonic techniques can also be used for

TABLES I

CURRENT AND POTENTIAL APPLICATIONS

Operation	Current Diamond Bort Consumption, pct	Diamond Wheel Grinding	Process Evaluation of Applicability*			
			Electro-lytic	Electro-sparking	Electro-arcng	Ultrasonic
Sharpening single-point tools.....	30	A	B	B	C	B
Grinding single-point tool chipbreakers.....	20	A	B	B	C	B
Sharpening milling cutters & broaches....	15	A	B	B	C	B
Grinding projectile cores.....	5	A	B	B	C	B
Shaping & finishing dies.....	4	A	D	A	D	A
Forming turbine bucket root sections.....	0	B	B	B	C	B
Rifling gun barrels.....	0	B	C	B	C	B
Machining & grinding turbine compressor discs.....	0	B	B	B	C	B

* A—Currently in use on production scale.

B—Appears applicable. Promising but limited experimental data to date.

C—Questionable applicability. Future developments might make more promising.

D—Limited applicability or not applicable. No promise in present state of development.

grinding single-point tools. The cutting time with electro-sparking may be excessive, and getting low-microinch surfaces may be expensive. The ultrasonic technique produces good surfaces with no cracks. Again, however, the ability to produce sharp corners needs to be tested. Pure electro-arc grinding produces finishes too rough for tools. However a combination electro-arc grinding and electrolytic process may prove suitable.

Chipbreakers are ground on some carbide tips, and present a different problem than grinding the tool areas. The effective grinding area is much smaller. The same type of surface specifications, and sharp corner requirements, apply. This use accounts for 20 pct of diamond bort consumption. Machine grinding is required.

May be cheaper than grinding

The ultrasonic process appears especially promising for this application. The cost will probably be lower than for grinding the tool angles by this method. The ability to produce the necessary sharp corners has not yet been studied.

The electrolytic and electro-sparking techniques also appear to have application for chip-breaker grinding. Conventional grinding machines could be converted for electrolytic grinding. In this case, again, the cutting time of electro-sparking might make it expensive.

Many milling cutters and broaches have inserted carbide teeth, which are in effect individual single-point tools. They are usually removed and ground separately with diamond wheels. This consumes about 15 pct of this country's diamond bort total.

The operation is always machine grinding, in a special type of setup. For this work, as in grinding single-point tools, the electrolytic, electro-sparking, and ultrasonic processes show promise. The electro-arc grinding process has questionable value here.

The problem of grinding carbide projectile cores is different from the above applications, since the area to be ground is relatively large. At present this use accounts for only 5 pct of diamond bort. But the use of these cores might increase substantially in the future, and would probably become very large in case of full-scale war. All of the processes except electro-arc grinding appear suitable for this work, though little actual testing has been done.

Many wire drawing, textile, punching, and blanking dies are made of carbide or with carbide inserts. This type of use currently requires 4 pct of the diamond bort consumption for grinding, but is increasing. Electro-sparking machines are already in commercial use for shaping and finishing such dies. Several ultrasonic machines are also in commercial use

on this application. Both appear more versatile for this use than diamond wheel grinding. For producing shaped holes, they are much more satisfactory. The other two methods, electrolytic and electro-arc grinding, appear to have little or no application possibilities in this field.

A large potential exists in the use of carbide jet engine turbine buckets, or blades. These must be strong at high temperatures, and many materials are under investigation to replace the alloys now used. Carbides and ceramics have promise, and potential requirements run into millions of units.

Diamond form grinding on these blades is expected to be too slow and expensive. The electro-sparking, ultrasonic, and electrolytic processes appear to be capable of performing at least some of the finishing operations on carbide blades.

Another jet engine component problem is finishing of compressor discs. Titanium alloys are being considered for these discs, and these present grinding problems. Aluminum oxide wheels are consumed very rapidly in grinding this material, and diamond grinding apparently would be too slow and expensive. For this application, with the possible exception of electro-arc grinding, the new processes appear very promising. The electrolytic process has particular promise.

RECENT RELATED IRON AGE ARTICLES

New Method For Drilling Dies, July 10, 1947, p. 64.

Metal Cutting Techniques, Sept. 11, 1947, p. 185.

Electro-Mechanical Method X "Machines" Carbides, Hard Alloys, July 26, 1951, p. 65.

What You Can Do About The Diamond Wheel Shortage, March 6, 1952, p. 203.

Russians Machine Bearing Balls Electro-mechanically, March 13, p. 98.

Another potential defense application is rifling machine gun barrels. Defense preparations are rapidly upping the production requirements for this operation, so faster methods of rifling are desirable. The electro-sparking and ultrasonic techniques may find application in this work. The other two processes do not appear to be of value for rifling.

Except in die work, none of the new processes is in commercial use, although the familiar electric equipment for such work as removing broken taps is usually a form of electro-arc grinding equipment. A limited number of machines for utilization of the various processes, individually and in certain combinations, are becoming available. There seems to be urgent reason for accelerated development of machines, and testing of machines on these eight, and other applications.

When is stainless magnetic?—

Type 416 retains

MAGNETIC PROPERTIES AT 450°F



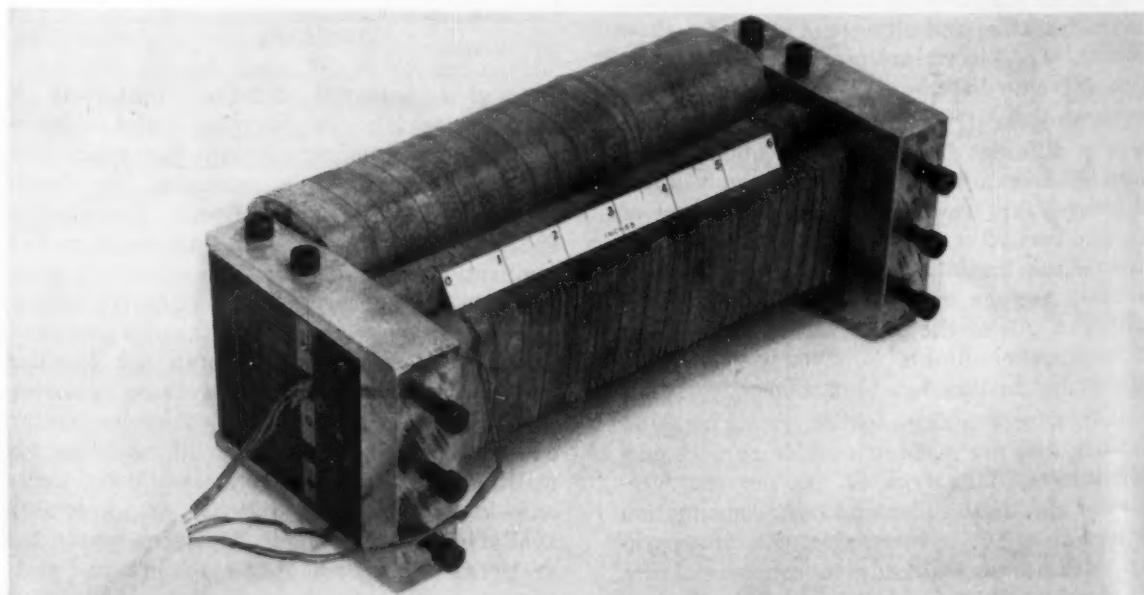
By R. H. Esling
Research Laboratories
Bendix Aviation Corp.
Detroit

Studies of type 416 stainless for use in a controller governing a high-temperature, high-pressure corrosive fluid system show that this alloy's magnetic properties undergo no significant change. Amount of hysteresis is slightly decreased at 450°F. A specially designed, Fahy-type permeameter was used in tests.

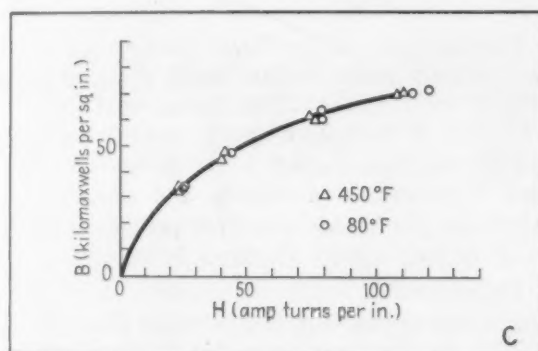
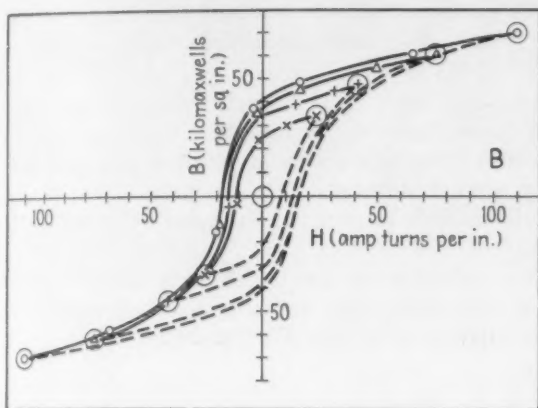
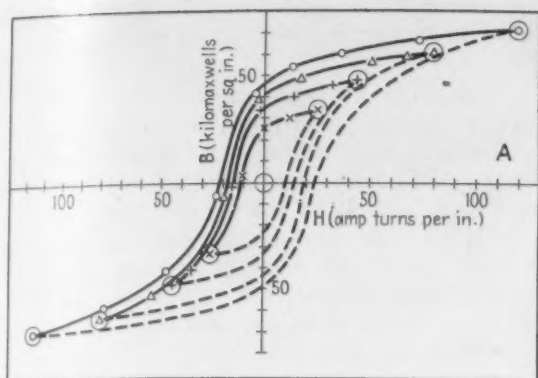
Equipment controlling high-temperature, high-pressure corrosive fluid systems requires a corrosion-resistant, magnetic material. The alloy would be used in electromagnetic-hydraulic controllers. Type 416 stainless steel was tested at a temperature of 450°F. The results

were compared to similar test data taken at room temperature.

The permeameter and associated electrical circuit were designed to have sufficient versatility to test any steel whose normal induction curve lies below 160 kilomaxwells per sq in.



SPECIALLY DESIGNED, Fahy-type permeameter that was used in elevated temperature studies of type 416 stainless.



HYSTERESIS curves derived from published room temperature data and tests at 450°F on type 416 stainless. Graph "A" shows the curves developed from tests at 80°F. Graph "B," the curves developed from tests at 450°F. Curve "C" shows how closely the results at these two temperatures parallel each other when plotted together.

This is over a range of magnetic intensity values up to 180 amp turns per in. Had type 416 stainless proved magnetically unsatisfactory at high temperature, other steels could have been studied.

In this permeameter, a direct current flowing in the magnetizing coil (the back coil in accompanying photo) creates a magnetic potential across each of the three bar specimens. Their ends show at the left of the permeameter. Because of this potential, magnetic flux is present in each of the specimens. The amount of flux is a function of the applied magnetic potential and of the specimen material. Any change in the

CHANGES IN MAGNETIC INTENSITY AND FLUX DENSITY OF TYPE 416 STAINLESS

[illegible]

Type 416 magnetic properties (continued)

magnetizing current will change the magnetic potential and, thus, the flux.

Such changes are shown in the accompanying table. Actually, changes in the magnetic potential per inch of specimen length, termed the magnetic intensity, are listed for each change in magnetizing current. Associated changes in magnetic flux density are also listed. The flux density is the flux per unit specimen cross-sectional area.

No significant change was observed in the normal induction properties of this material when its temperature was raised to 450°F. The adjacent drawings show the hysteresis curves plotted from the room temperature data and the 450°F tests. The normal induction curve is plotted as the locus of the tips of successively decreasing hysteresis loops. For the normal induction curve, points in the negative quadrant have been reflected into the positive quadrant.

A method from the literature* was used for plotting points on the hysteresis curve. Room temperature data and similar data taken at

*Smith, A. W., "Electrical Measurements in Theory and Application," McGraw-Hill Book Co., Inc., New York, 1948, p. 258.

450°F are in close agreement. Corresponding hysteresis loops show a slightly smaller area at 450°F.

This specially designed permeameter is of the Fahy type. Data is taken when this permeameter is in equilibrium with a temperature-regulated oven. Three specimens are accommodated simultaneously by the permeameter yoke, making it possible to take hysteresis data from three specimens in fairly rapid succession. When the oven temperature is changed to a different value, the three specimens reach equilibrium together with the new temperature, thus expediting the test program.

The permeameter is adaptable to a comparative study. The three specimens might be of different materials.

Research and development trends indicate that more data on temperature influence in magnetic properties should become available. This simple adaptation of a proved device should be able to produce such data with relatively little fuss.

The information on which this article is based was obtained in working on a government sub-contract with the Westinghouse Electric Corp.

NEW BOOKS

"The Making, Shaping and Treating of Steel," 6th edition. Few volumes have attained the position of honor in the steel industry held by "Making and Shaping." As a definitive reference, a compendium of basic information, past and present, in the iron and steel industry, the book has no equal. Of the many reference books which come to this office each year, few are so constantly sought after as this one.

The latest edition adds to the steelmaking reference the crowded technical and scientific advances of the steel industry during the past 10 years. The edition has been under preparation for 2 years and is based on the original text by J. M. Camp and C. B. Francis.

Technological progress in steelmaking in the past decade covers a broad field: New, tougher steels developed for war service; faster steel-making methods; revisions of steel compositions to conserve alloying elements in a new national emergency. These many changes involve not only new conceptions of steel as a material, but also practical ways of applying it successfully.

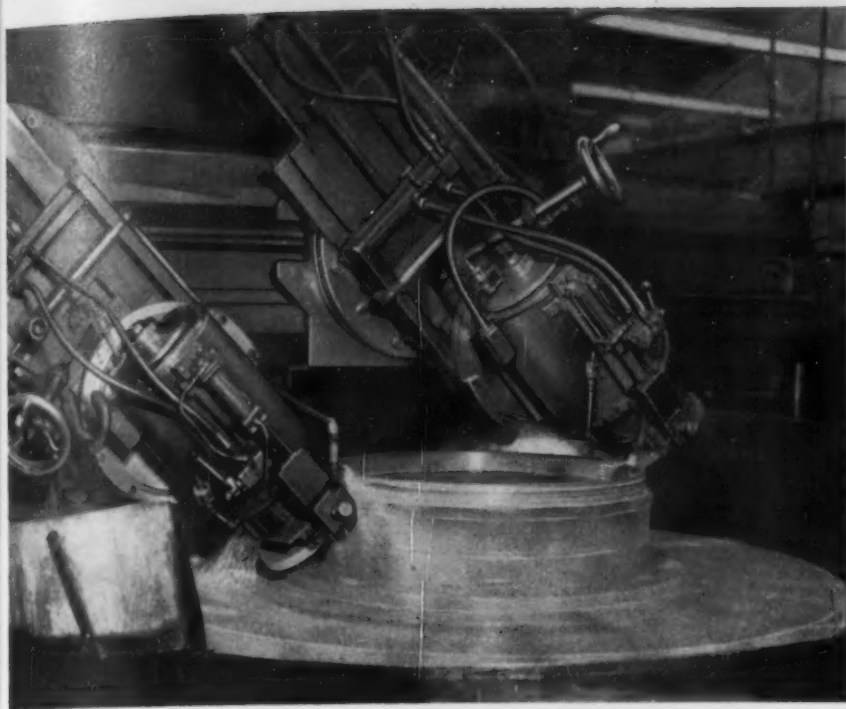
Authorities in each steelmaking field aided in preparing the new edition. Each of its 38 chapters, subdivided into sections, is as nearly independent of the others as possible. With more than 23,000 listings, the index of the sixth edition is cross-referenced and covers 148 pages. Most of the more than 700 illustrations are new and were selected to provide greater clarity and detail.

Representative of the tremendous strides in the industry made during recent years, is a chapter on principles of heat treatment of steel. The work of Bain, Davenport, Grossmann and others who have helped to reduce the art of heat treatment to a science, and who have made changes in steel structure predictable by comparatively simple diagrams, is included.

Understanding of thermodynamics, heat flow and ceramics has been broadened by Dr. J. B. Austin and his associates at U. S. Steel's Kearny Research Laboratory.

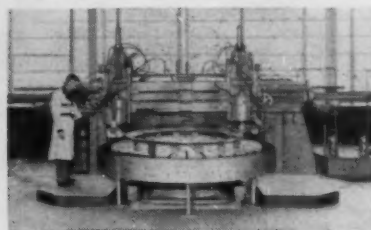
This growth of steelmaking knowledge made it necessary to revise large sections of the book. Subjects completely revised include: Fundamental Principles of Chemistry and Physics; Refractories; Manufacture of Pig Iron; The Bessemer Process; The Openhearth Process; Manufacture of Steel in Electric Furnaces; Steel and Iron Castings; Merchant Bar Production; Manufacture of Hot-Strip Mill Products; Manufacture of Cold-Reduced, Flat-Rolled Products; Manufacture of Tin Plate, with an entire new section on the electrolytic process; Metallurgical Aspects of Tin Plate; Principles of Heat Treatment of Steel; All chapters on various grades of steel; Mechanical Testing; and Gage Numbers.

United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa., \$7.50. Schools and colleges, \$5.00. 1584 p.

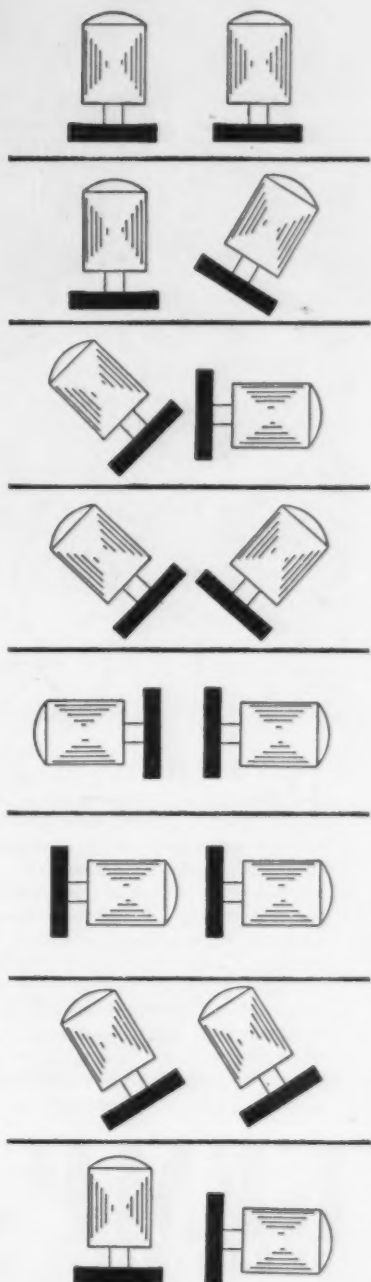


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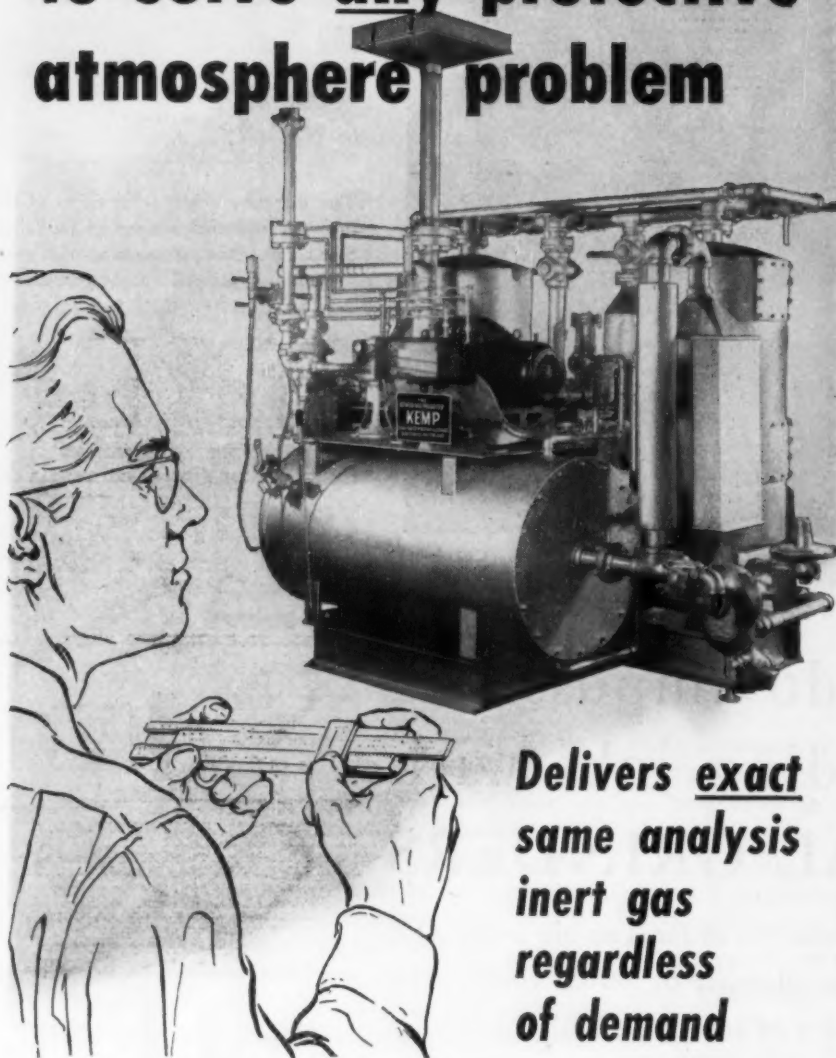
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Water systems

How to get the most out of water systems is discussed in a new folder the "Pittsburgh Service for Water and Waste Water Systems." Survey, test, cleaning, corrosion protection, designing, construction, repair, financing—are all part of the Pittsburgh service. *Construction & Engineering Div., Pittsburgh Pipe Cleaner Co.*

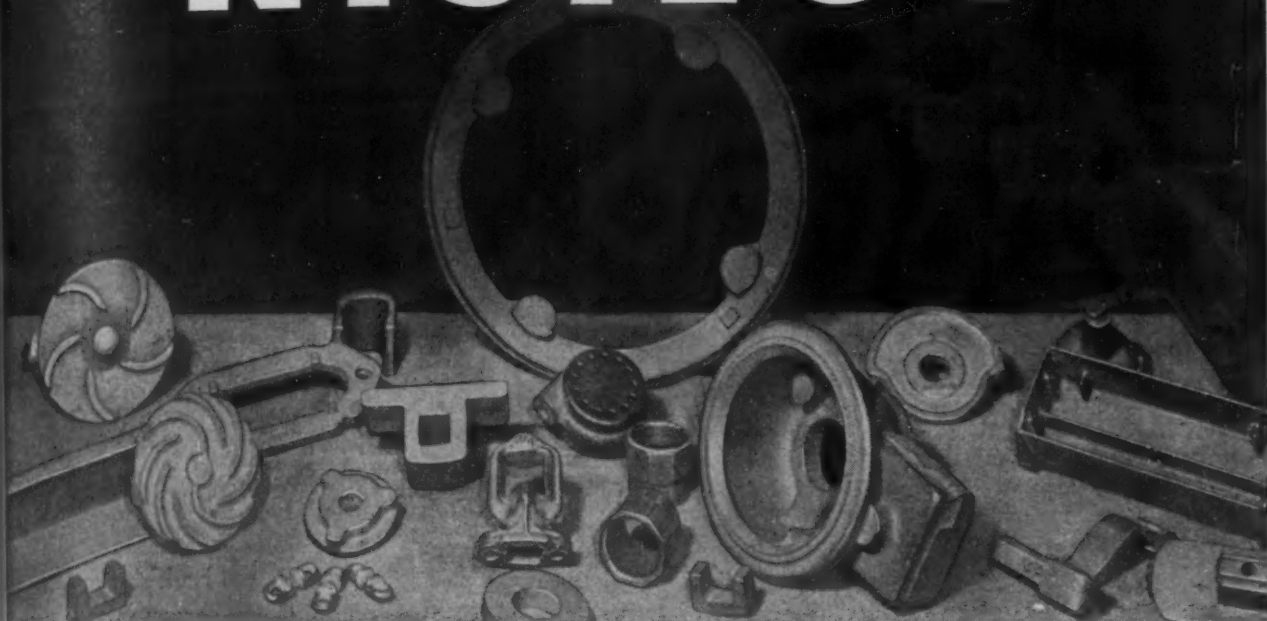
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Flexible Metal Hose

Uniflex, a flexible bronze metal hose that is both seamless and pressure tight is described in two new booklets. Designed primarily for conveying liquids or gases while withstanding high temperatures, corrosion and abrasion, Uniflex is also an ideal vibration eliminator. Fabricated by an unusual method, this hose of helical construction distributes the flexing between the inner and outer convolutions, allowing greater flexibility and longer life. For additional safety the hose is produced with a covering of one or more layers of tensile bronze wire braid. *Titeflex, Inc.*

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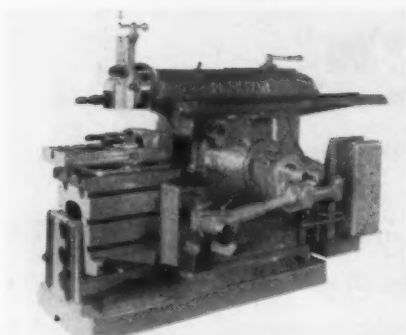


Drop hammer uses hydraulic clamping

Design of a new pressure impact hammer is based on the principle of a heavy mass dropping a short distance, resulting in a longer time interval of impact. The longer time interval at impact reduces the impact pressure, thus putting less pressure on the dies and extending the flow of material. The hammer has a hydraulically operated head to clamp the dies. Impact comes when the ram is dropped onto this intermediate head. The intermedi-

ate head, or die holding beam, is guided on four ground columns for accurate die register. Being hydraulically operated through a comparatively short distance, close tolerances can be held. The hammer is designed for driving dies, forging and coining operations. A range of pressure and impact combinations meet various requirements. *Pneumatic Drop Hammer Co.*

For more data insert No. 19 on postcard, p. 115

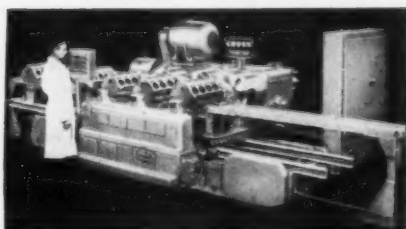


Shaper has electro-magnet clutch-brake

The new clutch and brake insures instant starting and stopping with a single finger tip control lever. The ram can be positioned quickly and accurately for setting tools by the instant action of clutch and brake. The single control is placed at the most convenient position for the operator. Clutch and brake operate without grab and are said to be

powerful and smooth in action. No adjustment of the clutch or brake is required for the life of the friction surfaces that are estimated to last up to 15 years of normal operation. Torque remains constant throughout the operating life. Clutch and brake are standard equipment. *Cincinnati Shaper Co.*

For more data insert No. 20 on postcard, p. 115

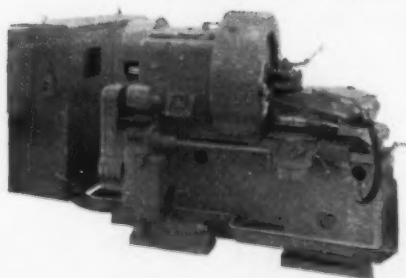


Production is rated at 81 pieces per hour

Boring and facing flywheel housings and cylinder block assemblies are accomplished on a new Transfer-matic. The work travels from an incoming conveyer to the machining station and from there to an outgoing conveyer. The machine

bores the transmission hole and faces the transmission face concentric and square with the crankshaft bore. Downtime is greatly minimized by the use of pre-set tools. *Cross Co.*

For more data insert No. 21 on postcard, p. 115



Machine contour faces jet engine disks

The LeBlond contour facing lathe was designed for profile facing compressor disks of jet aircraft engines. A hand adjustment reading to 0.001 in. on a graduated dial sets up the depth of facing cuts. Two headstocks are offered: a high-speed head for aluminum disks and one for stainless steel and titanium

disks. Machines can be reversing or non-reversing and equipped with manual or automatic controls. On the automatic version, the LeBlond Hydra-Trace is an integral part of the design. Angle of the tracer slide is adjustable. *R. K. LeBlond Machine Tool Co.*

For more data insert No. 22 on postcard, p. 115
Turn Page

IDEAS IN PLASTICS FROM G.E.'s MOLDING SERVICE

HOW TO GEAR PLASTICS TO CUT COSTS

G.E.'s COMPLETE MOLDING SERVICE OFFERS YOU —

- ✓ Complete mold-making facilities
- ✓ Impartial material selection
- ✓ Injection presses from 3 to 208 ozs.
- ✓ Compression presses from 3 to 36 ins.
- ✓ Complete extrusion facilities
- ✓ Complete silicone rubber fabricating facilities
- ✓ Complete molded mycalex facilities

PLUS the benefit of 60 years' experience in designing, engineering and molding plastics parts.

These molded *plastics* gears, replacing *metal* in an oscillating fan, are an excellent example of how General Electric's *complete* plastics molding service can cut costs for customers — in this case, by *no less than 63%!*

Part of this substantial saving was accomplished by substituting a nylon gear and pinion, molded as a unit, in place of a steel pinion and laminated plastics gear which required hobbing, cutting and assembling. Besides reducing costs, the new plastics gears wear better and operate more quietly.

You can depend on General Electric's *complete* molding service for cost-saving ideas like this. Perhaps this example will suggest some use for molded plastics in *your* business. If so, G.E. will be glad to work with you. One of the world's largest plastics molders, G.E. has the "know-how" and facilities to produce your biggest jobs efficiently and economically.

For information, just write to General Electric Company, Section M-2, Chemical Division, Pittsfield, Massachusetts.

You can put your confidence in —

GENERAL  ELECTRIC

March 20, 1952



PAGE

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HIGH CARBON
STAINLESS
SPECIAL ALLOY
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—Page can draw
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Tell us the way you want it. We'll follow your specifications.

Cross-sectional areas up to .250" square; widths up to 1/2"; width-to-thickness ratio not to exceed 6 to 1.

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AMERICAN CHAIN & CABLE**

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Los Angeles, New York, Philadelphia,
Portland, San Francisco, Bridgeport, Conn.

New Equipment

Continued



Hobbing presses

Hydraulic presses for hobbing and closed die forging have four column design and all-welded steel construction. They are manufactured in various bed areas and ram strokes, and from 100 to 1000 tons capacity. The 400-ton press illustrated has a bed working area of 20x25 in., ram stroke of 12 in. and 16-in. daylight. It is for hobbing; powered by a 10 hp motor. The down-moving, double-acting cylinder is controlled by a four-way valve. *Oilpower Engineering Co.*
For more data insert No. 23 on postcard, p. 118



Induction furnace

Developed for high speed production of precision castings, a mechanically operated induction furnace transfers molten metal from furnace to mold in any pre-set cycle, usually a few seconds. Operation is simple. Molten metal fills the mold at a desirable pouring rate, insuring uniform precision castings with a minimum of skilled labor. The furnace operates at a frequency of 30,000 cycles. *Ajax Electrothermic Corp.*

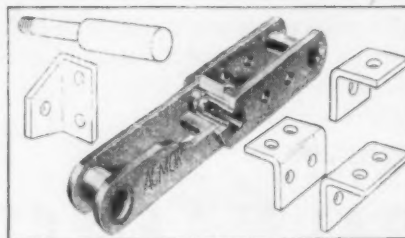
For more data insert No. 24 on postcard, p. 118



Protective faceshield

Improved vision, elimination of dead air space, and relief from binding discomforts are a few advantages attributed to a new protective faceshield. Called the MSA chest-mounted faceshield, the protector is comfortably supported by easily adjusted neck and chest straps that provide balanced weight distribution. Chipruf visor is adjustable, available in various sizes. *Mine Safety Appliances Co.*

For more data insert No. 25 on postcard, p. 118



Conveyor chain

In either steel roller or bushing type in 2, 2 1/2, 3 and 4-in. pitch, stock attachments that are either bolted or welded to the chain proper are available for all pitches. *Acmor Conveyor Chain Co.*

For more data insert No. 26 on postcard, p. 118

Turn Page



STRETCH OUT YOUR STAINLESS, TOO

There *are* ways to stretch out your supply of stainless.

For example, you may be using a grade or finish of stainless that is in extreme demand when another similar one, not as tight, could do the job adequately.

Our metallurgical staff and stainless fabricating specialists are ready to help you look into this matter and to advise you on more readily-available types of stainless that will do a satisfactory job. Feel free to call on us for this specialized help.

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52 years of *Fine* steelmaking

first name in special purpose steels

STAINLESS STEEL

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REZISTAL STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

March 20, 1952

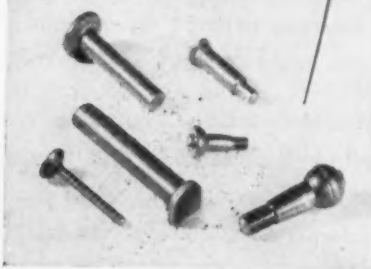
123

2 profitable ways
you can use
CLEVELAND
production service
for your
Special parts



Your non-standard parts manufactured *complete* by the Kaufman *Double Extrusion Process*—a tougher product, produced with accuracy of dimensional detail—ready for your assembly line;

— OR —



parts which can be pre-formed by forging—ready for further shaping and machining in your plant. Your advantages are the economy over an all-machined part and the extra strength gained through forging by the Kaufman Process. Write for bulletin "Specials by Specialists."

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THE CLEVELAND CAP SCREW COMPANY

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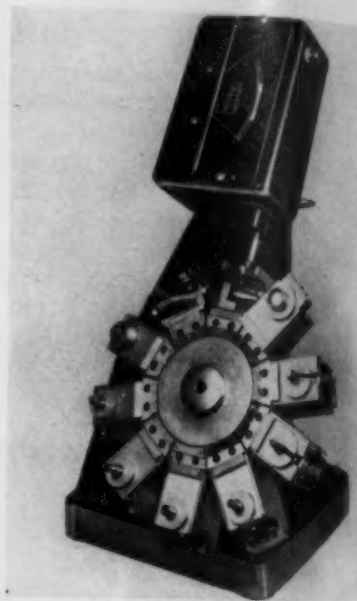
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originators of the Kaufman **DOUBLE EXTRUSION** Process

Ask your jobber for Cleveland Fasteners

New Equipment

Continued



Turret comparator

The Sigma turret mechanical comparator has one measuring head with a revolving turret including adjustable fixtures for checking up to 10 dimensions of a workpiece. Fixture capacity is 2 in. The head is mounted in an inclined position on a pedestal fitted with a 10-station indexing turret. Each station holds a fixture to check one of ten dimensions. Four standard fixtures measure internal and external diameters, external lengths and internal depths. *Cosa Corp.*

For more data insert No. 27 on postcard, p. 115

Rust inhibitor

Pennsalt EC-51, a new rust-inhibiting organic-type metal cleaner, combines detergent action with rust protection. Steel parts cleaned with the product reportedly obtain protection from rusting for up to 6 weeks under normal plant conditions; under unfavorable conditions, protection for 2 to 3 days can be expected. The cleaner removes soil from nonferrous metals without staining or etching. EC-51 has proven successful in cleaning prior to painting. The product is used in concentrated or diluted form, applied by spray and immersion methods. It is non-caustic, non-explosive, harmless to the hands. *Pennsylvania Salt Mfg. Co.*

For more data insert No. 28 on postcard, p. 115

Turn Page

KING

FIFTH



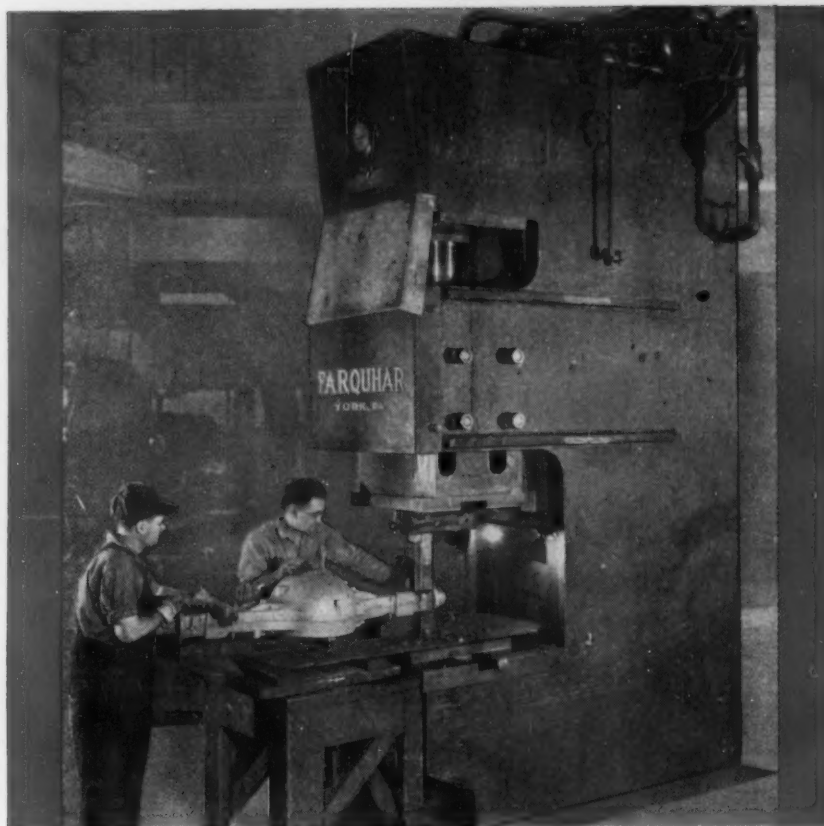
In the industrial centers of the United States the name "King Fifth Wheel" is best-known for bent and welded rings. Specify "King" for all your bending jobs.

KING FIFTH WHEEL COMPANY
2915 North Second St., Philadelphia 33, Pa.



WHEEL

COMPANY



ALBION MALLEABLE IRON CO. cuts cold-shearing costs with **FARQUHAR** **Hydraulic Press**

The Albion Malleable Iron Company produces automotive castings at its Albion, Michigan plant. Cold-shearing the gates from the castings in this modern plant requires dependable, trouble-free equipment, and for this equipment Albion turned to Farquhar engineers. After studying the problem, Farquhar recommended a 200-ton self-aligned, gap-type Farquhar Hydraulic Press. This press not only proved completely satisfactory in operation, but was also able to effect substantial economies because it was designed *specifically* for the job in hand.

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in heavy produc-

tion. Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

Farquhar engineers are ready to help solve whatever production problem you may have. Give them a call.

Send for Free Catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry. Write to: A. B. FARQUHAR CO., *Hydraulic Press Division*, 1503 Duke St., York, Pa.

GET THE DETAILS on how our Deferred Payment Plan helps you pay for your Farquhar Hydraulic Press out of the savings it produces!



New Equipment *Continued*

Weld-through sealer

An aluminum-colored weld-through sealer is a heavy paste-like material that resists the heat and pressure of welding without splattering or burning. The sealer is applied to faying surfaces before spotwelding, eliminating the need for a sealing operation after welding. It does not interfere with the welding operation. *Minnesota Mining & Mfg. Co.*
For more data insert No. 29 on postcard, p. 111

Lens tissue

Silicon-treated tissues for keeping safety goggles clean and polished are packed in 800-sheet packages. Tissues leave an invisible coating of silicone on lenses which protects them and offers longer clarity. *General Scientific Equipment Co.*
For more data insert No. 30 on postcard, p. 111

Carbide tool grinder

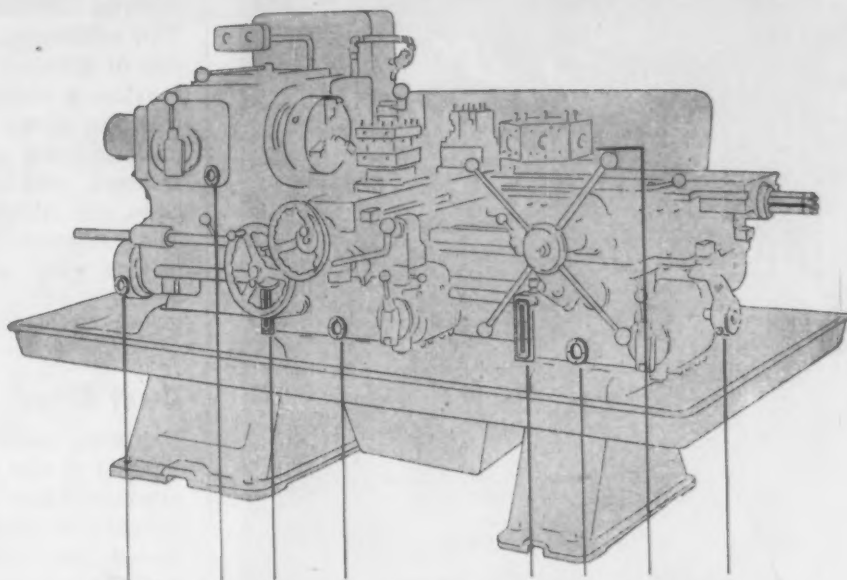
Without any special attachments, the new Type 178 Constan carbide tool grinder can be used for grinding all types of carbide tools, however complicated their profile. An attachment is available, however, for grinding carbide inserted tooth milling cutters. Universal ball and socket vise combined with an inclinable table permit clamping the tool easily in any position. The wheelhead consists of a motor unit carrying a diamond wheel at each end—one for roughing and one for finishing. Each may be brought into position as required. Coolant is sprayed out through holes in the center of the wheels by centrifugal force. *H. E. B. Machine Tools, Inc.*
For more data insert No. 31 on postcard, p. 111



Turn Page

another reason why J&L turret lathes produce

**MORE CHIPS PER TOOL
MORE PIECES PER HOUR
MORE PROFIT PER JOB**

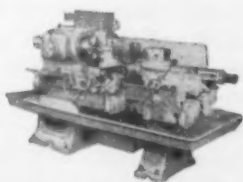


JUST A FEW SPOTS TO WATCH!

FEWER FITTINGS NO GREASE CUPS AUTOMATIC LUBRICATION

MORE EFFICIENT LUBRICATION!

Proper lubrication of J&L Turret Lathes depends very little on the operator or maintenance crew. This saves the operator's time and cuts your maintenance costs. The gears run partially submerged in oil, and independent pumps supply fresh, clean oil under pressure to all sliding bearings. Metering pins at each lubricating point assure distribution of the proper amount of oil to each individual bearing. Oil is pumped in direct relation to the spindle speed. This means that in High Velocity Turning with carbide tools—when more lubrication is required—more oil is delivered.



P.S. This simple, built-in lubrication system guarantees your investment. Write to Dept. 710 for Catalog.

"World's most accurate and powerful turret lathes"

RAM TYPES: Bar, 1½" to 4½", Chuck, 10" to 12". **SADDLE TYPES:** Bar, 2½" to 5", Chuck, 12" to 18".

JONES & LAMSON

*Machine Tool Craftsmen
Since 1835*

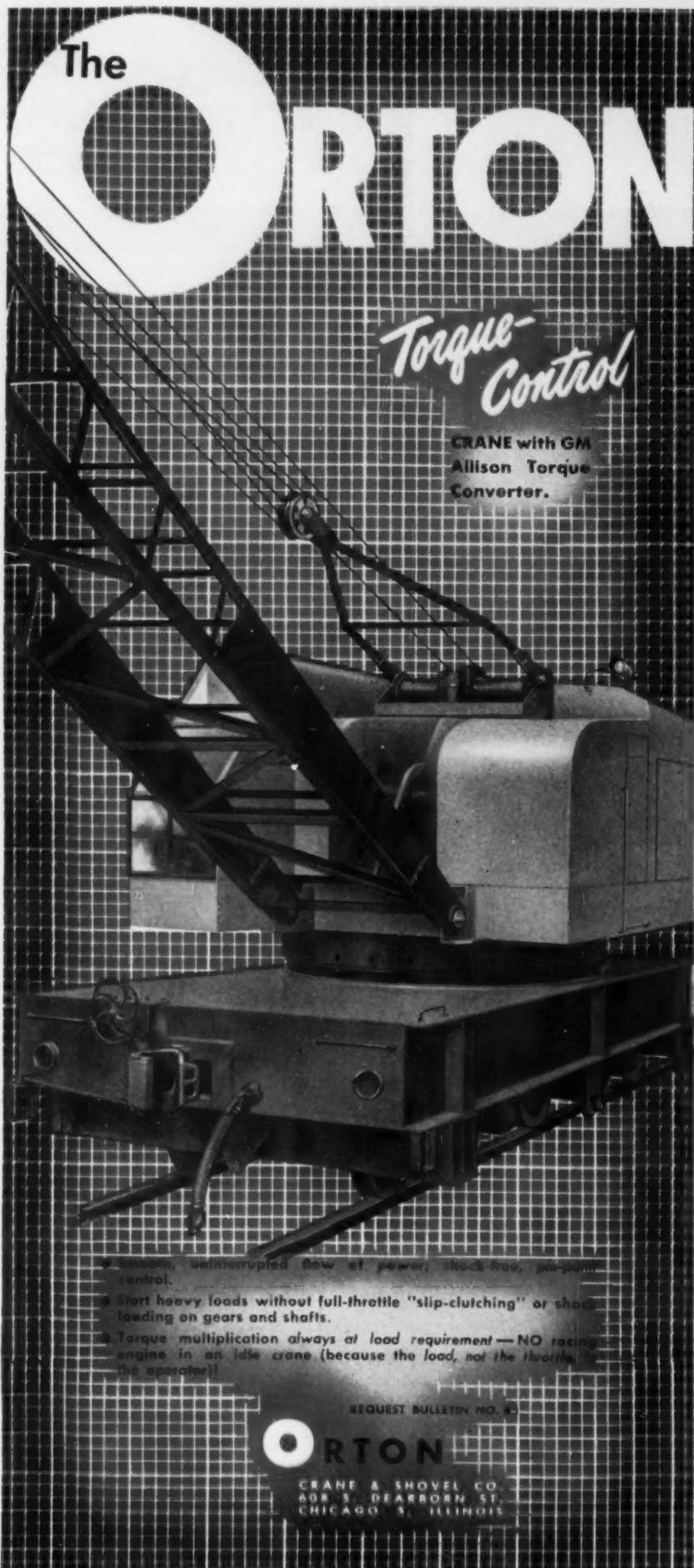
JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A.



TURRET LATHE DIV.

March 20, 1952

127



The ORTON

Torque-Control

CRANE with GM Allison Torque Converter.

Smooth, uninterrupted flow of power, shock-free, full-power control.

Start heavy loads without full-throttle "slip-clutching" or shock loading on gears and shafts.

Torque multiplication always at load requirement—NO taxing engine in an idle crane (because the load, not the throttle, is the operator!).

REQUEST BULLETIN NO. 32

ORTON

CRANE & SHOVEL CO.
608 S. DEARBORN ST.
CHICAGO 5, ILLINOIS

—New Equipment—

Continued

Gun mover

A compressed air operated device for the Lea emulsion spray method of applying liquid compositions to wide faced buffs automatically completes one pass each time the operator trips the foot pedal microswitch. This equipment is available in a series of different sizes. The largest provides a coverage of 2 to 40 in. with one spray gun moving at a uniform speed over a straight line traverse, which is supplied with clean, dry oil-free air at all times. The gun mover has a minimum of moving parts, all totally enclosed. *Lea Mfg. Co.*

For more data insert No. 32 on postcard, p. 111

Dust filter

Uniformly maintained suction and removal of dust from filter bags by reverse air flow are features of the Dynaclone, a new cloth filter designed for collecting industrial dusts from various operations. The fan on the system puts the collector housing under suction. A traveling device with an air tube to the atmosphere, moves across the open end of the filter bags. Suction on the housing causes air to enter the traveling device and flow through one bag at a time in reverse direction, causing the dust on the outside of the filter bag to loosen and drop off. *W. W. Sly Mfg. Co.*

For more data insert No. 33 on postcard, p. 115

Low-cost sales films

A small manufacturer can make his own 10-min sales or training films in sound and color at an extremely low cost. A new 16 mm motion picture projector records and plays back sound by means of a stripe of magnetic material on the edge of the film. The portable unit with projector, amplifier, speaker and microphone is contained in a single case. It requires no special equipment; no sound-proof room to make recordings. An inexperienced person can learn how to mix voice and background music in a matter of minutes. *Bell & Howell Co.*

For more data insert No. 34 on postcard, p. 116

Turn Page

Case History No. 106

Rolling Mill Screwdown

9/10 LESS Lubricant Used

THE IP LUBRICANT

with "Indestructible pH-ilm" capable of
withstanding pressures up to 50,000 psi.

With **BROOKS**

LEADOLENE

On each eight hour shift in a large eastern steel plant 30 gallons of good quality steam cylinder oil were used on each of the two screws of a modern slabbing mill. Then LEADOLENE was thoroughly tested, and the tabulated results showed that only 3 gallons per eight hour shift were used on each screw . . . a savings of 9/10 on lubricant consumption. In addition, operating temperature of

the screws was reduced from 210° F to 140° F.

On rolling mill screwdowns, the most difficult of all screws to lubricate, LEADOLENE consistently has reduced lubrication consumption and extended equipment service life. With its "Indestructible pH-ilm," plus high adhesiveness, exceptional temperature characteristics, and low pour point and viscosity, LEADOLENE gives superior service on all types of screws used to move apparatus . . . whether open or enclosed, horizontal, vertical, inclined, high or low speed.

Write for technical data or generous samples for your testing.

With LEADOLENE You Get These Characteristics Essential to Good Screwdown Lubrication

pH-ilm Strength . . . 50,000 psi minimum.

Adhesiveness . . . Affinity for metal develops maximum adhesion and reduces dripping and creeping.

Water Repellence . . . Effectiveness is not reduced by water.

Corrosion Prevention . . . Never acidic and will not etch or corrode.

Compounded Stability . . . Will not bleed or change physical condition within a greater temperature range.

Low Temperature Factors . . . Does not harden, crack or decrease in adhesion.

Abrasive Resistance . . . Repellent to adhesion of scale, metallics and other contamination.

The Brooks Oil Co.

Since 1876

Executive Offices and Plant . . . CLEVELAND, OHIO
Executive Sales Offices . . . PITTSBURGH, PA.
Canadian Offices and Plant . . . HAMILTON, ONTARIO
Cuban Office . . . SANTIAGO de CUBA

Pay Less Per Wipe

For the countless
wiping jobs that
occur in your
plant . . .



★ You'll Save Time and Money with

MARATHON
Industrial Wipers

Whatever the wiping job, MARATHON Industrial Wipers will help you save two ways:

★ they cost less!

No matter what kind of wiping rags or shop towels you are now using, chances are MARATHON will cost you less. Our modern processing plant and great volume make it possible for us to produce finer wipers at lower cost.

★ they cost less to use!

The right wiper size and texture for every type of job, makes wiping easier, faster, and more efficient. There are 70 Standard Grades of MARATHON Wipers—to fit every requirement.

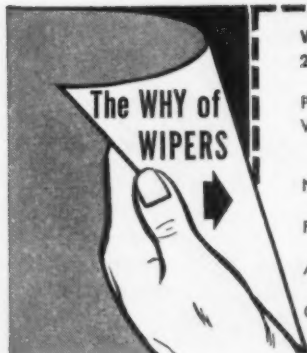
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Please send me, without obligation, a free copy of THE WHY OF WIPERS.

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Address _____

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IA

New Equipment

Continued

Palm oil replacement

Palmoshield, a workable replacement for imported palm oil, is said to duplicate every chemical characteristic of the imported oil. It looks, feels, acts and handles like palm oil, and requires no changes in rolling mill operation. Palmoshield is subject to exact chemical control. *Ironsides Co.*

For more data insert No. 35 on postcard, p. 115

Ground corn cobs

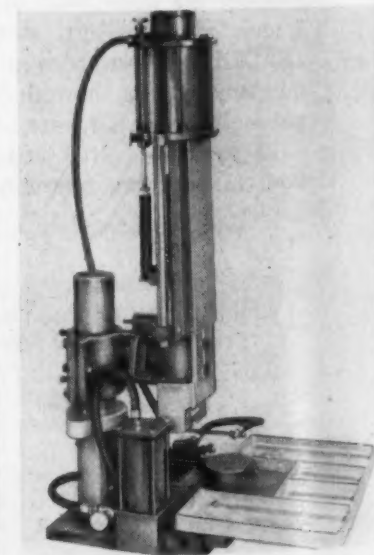
Cob-Dri will be available to manufacturers who use ground corn cobs for drying, buffing, tumbling or polishing, in a choice of three grades: coarse, medium and fine. It will be fully dust free and graduated to exact uniformity. *Frank Miller & Sons.*

For more data insert No. 36 on postcard, p. 115

Improved staking press

Operating speed of a new staking press can reach 100 strokes per min, depending on nature of the work and skill of the operator. The press has a built-in, quick-exhaust valve. An air-ejection system removes work automatically from the lower die. The machine delivers a controlled impact from 0 to 12,000 lb, or a squeeze 12 times air-line pressure. Stroke may be set for 1 or 2 in. The machine is a bench model for light staking, forming, and secondary-press work in which speed, precision and low fatigue are important. *Winter Products, Inc.*

For more data insert No. 37 on postcard, p. 115



Industry Expects Quick Showdown on Wages, Prices

Window dressing nearly exhausted . . . Feel need to get down to brass tacks . . . Final decision still rests in White House . . . Decontrol showdown expected to be next.

The margin of uncertainty over steel wages and prices is rapidly narrowing. The big show is running out of window dressing. All parties feel an urgent demand to get down to brass tacks. This will bring the highest officials into rapid and final negotiation through their intermediaries. The stage is set; the climax comes none too soon.

Regardless of the hope for eleventh hour strike postponement, the steel industry will lose vital production this week. On the chance that the steelworkers' wage policy committee would refuse to postpone the strike deadline, the industry had to be prepared. This meant it had to start idling facilities by midweek, so that a strike wouldn't cause undue damage to them.

How and When—There was little doubt that Wage Stabilization Board recommendations would win quick support from the union. A friendly Administration had once more furnished Phil Murray the key to industry's cash box. The steelworkers will get a big slice of what they are after. Settlement details now hinge largely around how and when.

Almost forgotten now are the early days of the bargaining when it was generally conceded that the union was entitled to only 5 to 7¢ per hr under the wage stabilization formula. Now the Steel Panel has stated that any figure from 9 to 23 cents can be granted.

Too Small—The biggest obstacle to quick settlement is that the Administration has been unwilling to allow an equally liberal interpretation of price stabilization.

In the case of prices, officials have unswervingly insisted on literal interpretation to the letter of the law. In addition they have offered \$2 to \$3 per ton price increases under the Capehart Amendment as bait—even though the industry is entitled to this regardless of a wage increase.

Cost analysis by steel companies shows that it would take at least \$6 a ton to cover a 15¢ wage increase; or more than \$7 to cover 18½¢. That's why they have been taking dead aim at the \$2 to \$3 trial balloon that has been floating their way from Washington. If there is a strike, this will be the crux of it. They will not trade the recommended wage increase for that amount of price relief.

Strange Twist—Strange, as it sounds, this is also worrying Mr. Murray a little. He wouldn't relish striking for higher prices in the steel industry, which would appear to be a reversal of position.

The areas of compromise have already become well-beaten paths. This leaves the final decision where it has rested from the beginning—on the doorstep of the White House. Action which will enable the industry to keep vital steel production going may be relayed through Defense Mobilizer Wilson.

No Turmoil—Despite the very grave threat of strike, consumers were not pressing the mills for delivery of steel. Ordinarily, even a hint of strike will throw the steel market into a frenzy, as consumers hedge to assure their supply and beat expected higher prices. Present apathy may be attributed partly to the government's firm

grip on steel distribution and prices. But many in industry believe it is another convincing sign that balance between supply and demand is much closer than the government is willing to admit.

If large production losses can be avoided, the clamor for decontrol will soon become irresistible. Planners and controls officials have been caught far out on a weak limb. Now they are struggling frantically to reverse their direction without appearing ridiculous. Just-in-case plans for decontrol are well underway. But a last ditch fight to keep control will be made.

Brighter Side—The industry is in a good position to turn the march toward steel saturation into a run—if a strike doesn't clog the spigot. Steel is reaping the fruit of its expansion program quicker than most other basic industries. It got a head start by reacting quickly after Korea.

Raw material problems, while not completely whipped, aren't hampering production to any appreciable extent. For the present, at least, the industry has enough scrap. Mills have become very choosy in their purchasing. And they reject any material that isn't up to snuff. A long-term shortage may still exist, but it isn't bothering production now.

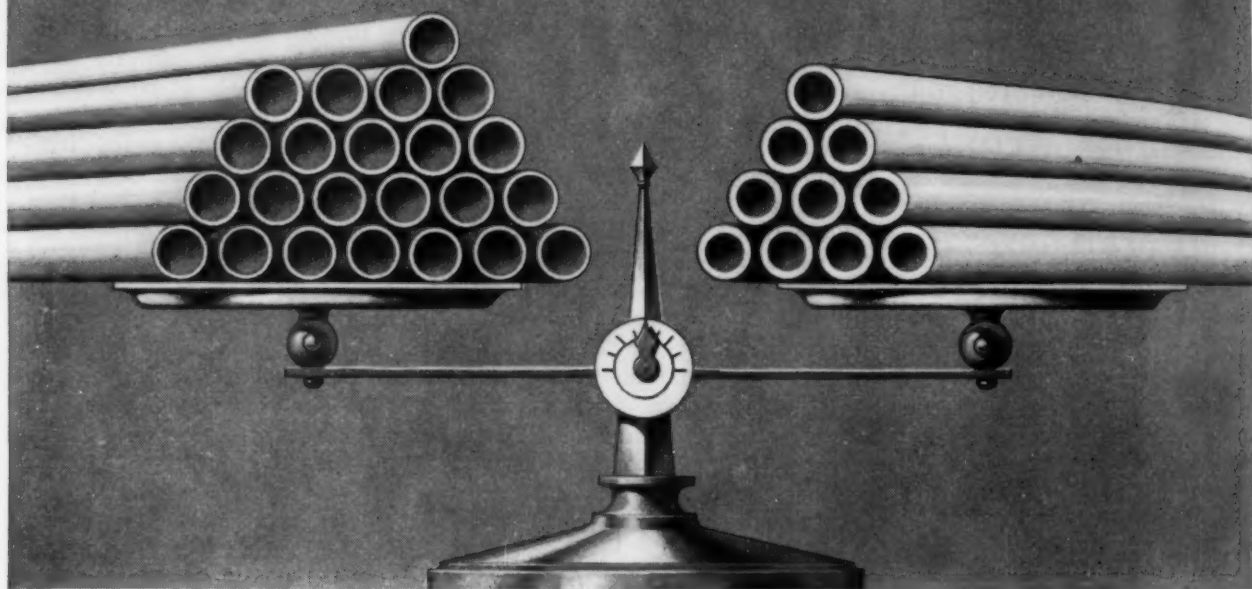
Steady—Steelmaking operations this week are scheduled at 102 pct of rated capacity, unchanged from the previous week. This is a highly tentative figure, subject to drastic revision if high-level bargainers lose their tempers or their touch.

A union shop recommendation by WSB could also become a strike issue. The industry is dead set against this clause, insisting that workers should be free to choose whether or not they wish to join the union.

Sure Stainless Pipe is Tough to Get...

but... using light weight *Schedule 5 Pipe*
will almost double the supply

...and you pay less per foot!



What Schedule 5 Pipe Is—

A light wall pipe, Carpenter *Schedule 5* gives you more feet of pipe for every pound of scarce stainless steel. So you can quickly see how *Schedule 5* increases the amount of pipe available and reduces your cost per foot. Plus the fact that the larger I.D. means increased flow area.

How Schedule 5 Reduces Costs

First saving is 40% to 50% on the cost of your pipe. And, because *Schedule 5* lets you use the next smaller pipe size, you reduce by as much as 25% your costs of valves, fittings, etc.

How It Hooks Up With Tube

This pipe is easily adapted to use with existing lines of tubing or Schedule 40 and 10 pipe, using simple connectors available from several manufacturers.

Why It Means More Pipe

You get *more feet of pipe* for every pound of material with Carpenter *Schedule 5* Stainless Pipe. And we don't have to tell you how important it is to get *more steel* from every pound of nickel and chrome these days.

Data Sheets give you complete information about Carpenter *Schedule 5* Stainless Pipe. Write for your personal copy.



Carpenter



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THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.

Export Department: Carpenter Steel Co., Reading, Pa. "CARSTEELCO"



- guaranteed on every shipment

Market Briefs

New Mill—North American Steel Co. will break ground for a new integrated steel mill this spring at Comanche, Iowa, on the Mississippi River. The 400-acre, \$66 million initial plant will consist of two blast furnaces, 96 coke ovens, and a bar and billet mill. Pig iron and coke production are planned for the close of 1952, with the steel forming facilities to follow during 1953. C. A. Depue, president of Central Steel Tube Co., Clinton, Iowa, heads the new corporation. His plan calls for the eventual production of steel, along with plate and sheet rolling mills. A certificate of necessity was granted Mar. 1.

New Pipeline—Canadian oil will be brought across the Rocky Mts. by a 700-mile pipeline from Edmonton to Vancouver, B. C. Construction of the 24-in. line is scheduled to start early this year. Trans Mountain Oil Pipe Line Co. expects to finish the job by the end of 1953. When finished, the line will have a capacity of 75,000 bbl per day.

In Balance—Demand for sulfur in second quarter 1952 will be about equal to production, National Production Authority predicts. Government officials predict an annual rate of sulfur production by 1954 of about 7,111,000 long tons. They have set a goal of 8,400,000 long tons of annual production by 1955.

Overseas Use—New Process D-Enameling Corp., Aurora, Ill., is now considering license applications from firms in foreign countries for its patented process. (THE IRON AGE, July 26, 1951, p. 89.)

New Furnace—Electro Metallurgical Co. has placed in operation its sixth electric furnace for the production of electrolytic manganese at its Marietta, Ohio, plant. Eight more furnaces are now under construction.

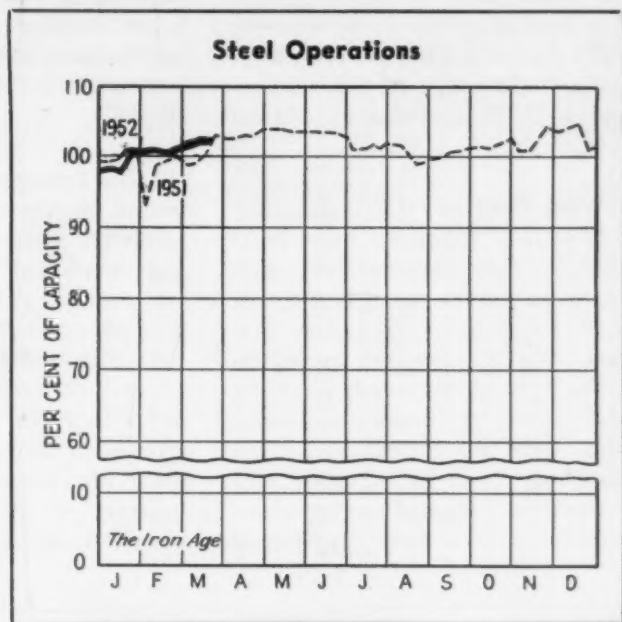
Steel Shipments—January finished steel shipments to direct military users, warehouses and industrial equipment makers showed substantial gains. Shipments to automotive, appliance, container and railroad industries declined. Others held steady. The direct military shipments, highest since World War II were still only 2.5 pct of the total. Warehouses got 19.7 pct of total, automotive, 15.3 pct.

Easier Steel—Detroit continues to be one of the easiest areas in the steel market, despite permission to build more cars. Last week one electric furnace mill cut back operations from 7 to 5 days a week. Automakers think there will be plenty of steel for whatever auto production boosts are permitted.

Mica Program—A 3-year purchasing program has been set up by General Services Administration with the idea of encouraging discovery, development, and production of mica. Depots are being prepared at Keene, N. H.; Spruce Pine, N. C.; and Custer, S. D., to which miners may ship their mica for inspection and purchase. Prices will be paid for the mica ranging from \$3 per lb for Nos. 5½ and 6 "heavy stained" mica to \$70 per lb for No. 3 and larger "Good stained and better" processed block and film. Payment for "specified hand-cobbed" mica will be \$600 a short ton. Program will run until June 30, 1955, or until the government has bought up the equivalent of 25,000 tons of hand-cobbed mica.

Close Tin Deal—Indonesian representatives and Reconstruction Finance Corp., U. S. tin buying agency, finally came to an agreement early this week. Under the new contract the U. S. will receive 18,000 tons of tin per year for the next 3 years. The price is \$1.18 per lb, f.o.b. Indonesia, for the first 2 years. Later negotiations will set the third year price. This is the same price being paid Great Britain for Malayan tin and puts the U. S. in a better bargaining position with Malaya.

Furnace Down—The blast furnace at Mystic Iron Works, Everett, Mass., is scheduled to go down for about 6 weeks for relining.



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Mar. 9	103.0*	105.0*	102.0*	100.0	104.5	104.0	100.5*	100.0*	100.0*	102.0	94.0*	79.5	96.5	102.0
Mar. 16	106.0	103.5	102.0	100.0	103.0	104.0	103.5	107.0	100.0	102.0	98.0	84.0	91.5	102.0

Beginning Jan. 1, 1952, operations are based on annual capacity of 106,567,670 net tons.

* Revised.

Nonferrous Markets

Alcan Pushing U.S. Metal Deal

Need market for new Kitimat plant . . . Estimate 600,000-ton world shortage by 1960 . . . U. S. producers oppose firm deal . . . Washington optimistic on new tin deal—By R. L. Hatschek.

Canada is busy with a sales job. The job is selling the U. S. 300,000 tons of aluminum a year from 1955 to 1959 (see *THE IRON AGE*, Mar. 13, pp. 58, 73.) This is necessary, from the Canadian viewpoint, in order to have a guaranteed market for the aluminum produced by the huge Kitimat plant now under construction.

A week ago, Aluminum Co. of Canada vice-president Edwin J. Mejia predicted a shortage of the light metal by 1960. He "conservatively" estimated that world demand would reach 3.3 million tons annually by that time and that the American demand would be 1.8 million tons. Under the present schedule, world output will reach 2.7 million tons of which U. S. capacity will be about 1.5 million tons, leaving a world deficit of 600,000 tons and a U. S. shortage of 300,000 tons.

Want Caution — But domestic producers would rather make haste slowly. They have extreme confidence in future markets for the light metal but they realize that such markets are yet to be developed. They continually point out that aluminum demand has never been tested in a normal market and they may come in for some stiff competition if real softness develops. And a firm commitment

for Alcan metal might easily cut into future sales.

Main difficulty is that any expanded imports from Canada would not reach the U. S. until 1955. The aluminum is needed today for the large military demand and to save many civilian goods producers from going out of business.

Still Open — Washington's exploratory proposals on further expansion and a vast stockpile have already been killed but the Alcan deal is still open and pressure from independent fabricators may bring about some sort of arrangement. While the stockpile proposal was far above probable requirements, industry is fairly certain that defense planners will come out with another such proposal for a smaller tonnage than the 4 million-ton goal in 1963.

Little Change — Domestic copper output during February held at about the same rate as the preceding month but the totals were a bit slimmer. Primary crude output was off about 2000 tons to 77,462 tons and refined production was about 4000 tons lower than January with a total of 95,979 tons. Deliveries to fabricators dropped substantially from 130,430 tons in January to 104,795 tons in February. Refined stocks were off 1000

tons to 59,747 tons, according to the Copper Institute.

No Control Cut — National Production Authority has informed brass and bronze ingot makers that there will be no let up on copper controls for the foreseeable future. The agency did say, however, that the third quarter should see an improvement in the copper picture. Ingot makers, while somewhat better off than they have been, are still suffering from a lack of raw materials—primarily scrap.

Another Blast — The copper industry took another crack at the level of fixed prices for the red metal. It took the form of a statement by Norman Hickman, American Metal Co. vice-president, who said that 30¢ per lb would be a more realistic price than the 24.5¢ domestic ceiling. Mr. Hickman holds that the dual price system contributes to an unsound market by causing scrap dealers to hold out copper in expectation of higher prices.

If this is the case it would indicate that dealers don't have confidence in Office of Price Stabilization's statement that these prices will not be allowed to rise.

Chile Boost — Another contributing factor today seems to be Chile's seeking an additional 6¢ per lb over the 27.5¢ already being paid for that country's copper. Nothing new has been reported on this from any source, but if Chile adds the 6¢ as an export tariff it seems that little could be done by OPS.

Tin Dickering — Washington reports optimism on the latest tin talks with Bolivia. While nothing concrete has been reported on prices, duration or quantities, it is generally agreed by both U. S. and Bolivian conferees that an agreement can be reached. The influence of the new Reconstruction Finance Corp. head, Harry McDonald, seems to be an improvement.

NONFERROUS METAL PRICES

	Mar. 12	Mar. 13	Mar. 14	Mar. 15	Mar. 17	Mar. 18
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.215	\$1.215	\$1.215	\$1.215	\$1.215
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate 1/4 in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to 116¢; 36 to 38, 47.2¢ to 170¢.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, 1/4 to 1 1/2 in., 53.5¢ to 42¢; 3/8 to 1 1/2 in., 41.5¢ to 39¢; 1 1/2 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 59.5¢ to 29¢; 52S, 45¢ to 35¢; 61S-T4, 48.5¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in. 1 1/4 to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.42; 96 in., \$1.522; 120 in., \$1.902; 144 in., \$2.284. Gage 0.24 x 28 in., 72 in., \$1.379; 96 in., \$1.839; 120 in., \$2.299; 144 in., \$2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: F31-O, 1/4 in., 63¢; 3/16 in., 66¢; 1/8 in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., 1/4 to 0.311 in., 74¢; 3/8 to 1/2 in., 57.5¢; 1/2 to 1.749 in., 53¢; 2 1/2 to 5 in., 48.5¢. Other alloys higher. Base up to 1/4 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.087; 1/4 in. to 5/16, \$1.40; 5/16 to 3/4, \$1.26; 3/4 to 1, \$1.06; 1 to 2 in., 76¢; 0.165 to 0.219, 1/2 to 3/4, 61¢; 1 to 2 in., 87¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$8; Forgings, \$6.

Nickel and Monel

(Base prices, f.o.b. mill)

"A" Nickel Monel
Sheets, cold-rolled 77 60 1/2
Strip, cold-rolled 83 63 1/2
Rods and bars 73 58 1/2
Angles, hot-rolled 73 58 1/2
Plates 75 59 1/2
Seamless tubes 106 93 1/2
Shot and blocks 53 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68		41.38
Copper, h-r		37.53	
Copper, drawn		38.78	
Low brass	39.67	39.36	
Yellow brass	38.38	37.97	
Red brass	40.14	39.83	
Naval brass	43.20	37.26	38.52
Leaded copper		41.58	
Com'l bronze	41.13	40.82	
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.83	52.04	

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 19.00
Aluminum pig 18.00
Antimony, American, Laredo, Tex. 50.00
Beryllium copper, 3.75-4.25% Be. 1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be \$69.00
Bismuth, ton lots \$2.25
Cadmium, del'd \$2.55
Cobalt, 97-99% (per lb) \$2.40 to \$2.47
Copper, electro, Conn. Valley 24.50
Copper, Lake, delivered 24.625
Gold, U. S. Treas., dollars per oz. \$35.00
Indium, 99.8%, dollars per troy oz. \$2.25
Iridium dollars per troy oz. \$200
Lead, St. Louis 18.80
Lead, New York 19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex, 10,000 lb. 24.50
Magnesium, sticks, 100 to 500 lb. 42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York \$207 to \$210
Nickel electro, f.o.b. N. Y. warehouse 59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel 52.75
Palladium, dollars per troy oz. \$24.00
Platinum, dollars per troy oz. \$90 to \$93
Silver, New York, cents per oz. 88.00
Tin, New York \$1.215
Titanium, sponge \$5.00
Zinc, East St. Louis 19.50
Zinc, New York 20.20
Zirconium copper, 50 pct \$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot
No. 115 27.25
No. 120 26.75
No. 123 26.25
80-10-10 ingot
No. 305 33.00
No. 315 30.50
88-10-2 ingot
No. 210 41.50
No. 215 40.00
No. 245 34.50
Yellow ingot
No. 405 23.25
Manganese bronze
No. 421 30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max. 20.6
0.60 copper, max. 20.4
Piston alloys (No. 122 type) 21.2
No. 12 alloy (No. 2 grade) 19.5
108 alloy 20.6
195 alloy 20.8
13 alloy 20.8
ASX-679 20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2% 18.80
Grade 2—92-95% 18.60
Grade 3—90-92% 18.40
Grade 4—85-90% 18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer 37.84
Electrodeposited 33%
Flat rolled 38.34
Forged ball anodes 43
Brass, 80-20
Cast, oval, 15 in. or longer 34%
Zinc, oval 26 1/2
Ball anodes 25 1/2
Nickel 99 pct plus
Cast 76.00
Rolled, depolarized 77.00
Cadmium \$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn. 97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63
Copper sulfate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed 20 1/2
Nickel chloride, 375 lb drum 37 1/2
Silver cyanide, 100 oz lots, per oz. 67 1/2
Sodium cyanide, 96 pct domestic 200 lb drums 19.25
Zinc cyanide, 100 lb drum 47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21 1/2	20 1/2
Yellow brass	19 1/2	17 1/2
Red brass	20 1/2	19 1/2
Comm. bronze	20 1/2	19 1/2
Mang. bronze	18 1/2	17 1/2
Brass rod ends	18 1/2	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25
Radiators	14.75

* Dry copper content.

Ingot Maker's Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75

	Aluminum
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

	Copper and Brass
No. 1 heavy copper and wire	18 1/2—19 1/2
No. 2 heavy copper and wire	17 1/2—17 3/4
Light copper	16—16 1/2
New type shell cuttings	16—16 1/2
Auto radiators (unsweated)	14 1/2—14 3/4
No. 1 composition	18—18 1/2
No. 1 composition turnings	17 1/2—18
Unlined red car boxes	16 1/2—17 1/2
Cocks and faucets	15 1/2—16
Mixed heavy yellow brass	13—12 1/2
Old rolled brass	15—15 1/2
Brass pipe	16—16 1/2
New soft brass clippings	16—16 1/2
Brass rod ends	15 1/2—16
No. 1 brass rod turnings	15—15 1/2

Aluminum

Alum. pistons and struts	6 1/2—7 1/2
Aluminum crankcases	7 1/2—8
2S aluminum clippings	10—10 1/2
Old sheet and utensils	7 1/2—8
Borings and turnings	5—6
Misc. cast aluminum	7 1/2—8
Dural clips (34S)	7 1/2—8

Zinc

New Zinc clippings	13 1/2—13 3/4
Old zinc	10—10 1/2
Zinc routings	8 1/2—7
Old die cast scrap	6 1/2—7

Nickel and Monel

Pure nickel clippings	35—36
Clean nickel turnings	35—36
Nickel anodes	35—36
Nickel rod ends	35—36
New Monel clippings	28—29
Clean Monel turnings	20—21
Old sheet Monel	28—29
Nickel silver clippings, mixed	13—14
Nickel silver turnings, mixed	12—13

Lead

Soft scrap, lead	15 1/2—16
Battery plates (dry)	10—10 1/2
Batteries, acid free	7—7 1/2

Magnesium

Segregated solids	15—16
Castings	14—15

Miscellaneous

Block tin	100—110
No. 1 pewter	80
No. 1 auto babbitt	60
Mixed common babbitt	16 1/2—16 3/4
Solder joints	23—23 1/2
Siphon tops	60
Small foundry type	31—32
Monotype	18 1/2—19
Lino. and stereotype	17 1/2—18
Electrotype	16—16 1/2
Hand picked type shells	10—11
Lino. and stereo. dross	8 1/2—9
Electro. dross	7 1/2—8

Iron and Steel Scrap Markets

Scrap May Be Unwilling Strike Victim

If steel union strikes scrap industry will slow down . . . Mills won't do much buying . . . Shutdown may come at time when mills don't show much zest for buying . . . Easier market after?

If the United Steelworkers of America shuts down the steel mills the scrap industry will automatically lapse into a twilight state of activity. All signs point to steel mills not leaving more than a slim crack in the doorway to movement of scrap.

The shutdown will come—if OPS is not made to be more lenient with steel price increases — at a time when mills are slowing their buying activity. The urge to fatten stockpiles appreciably did not materialize and buying pressure from formerly desperate scrap buyers turned to near-indifference in recent weeks.

Logically, if mills were not breaking their necks for scrap while operating at top capacity they are certain to become almost totally disinterested when beset by a strike. The flow of scrap won't stop dead in its tracks because mills may want to stockpile a little scrap outside closed mills. But for practical purposes the scrap industry becomes steel's unwilling partner in the steel strike.

Thus the scrap market, tending to be slightly softer, will lose more market vigor when the problematical strike ends. Although it may not be sold to final consumers, scrap will continue to be generated during shutdown. When mills resume buying again they will enter a more strongly supplied market.

Pittsburgh — Deliveries to steel plants will be halted in event of a strike. But this will not necessarily stop total movement of scrap since some producers probably would stockpile material at points outside the mills. Others may decide to hold up shipments since inventories are more comfortable than in months. And a shutdown would tend to ease an already-soft market. Early this week the trade was pessimistic over chances

of a peaceful settlement of the wage-price dispute.

Chicago—Mills here report an easing of scrap inventory problems. There are indications that a number of yards are cutting the amount of steel scrap they have been holding, getting it into the market. Movement continues good, but there are signs of weakness. Buyers of electric furnace grades have been dropping out of the market, although prices have held firm. Turnings are moving slowly. No. 1 & 2 bundles have, however, been moving well.

Philadelphia—Increasing rejections and word of better mill inventories have taken their toll of collections. Dealers report their intake is off as much as 40 to 60 pct since the market turned "soft." Auto wreckers are burned up at all the flag waving and speeches now and have practically cut all scrap preparation. The trade feels that steel mills are now banking on allocations and hence no longer need huge stockpiles.

New York—The trade here is anxious to ship before a steel strike slows scrap movement to a snail's pace. But buying pressure from mills is not even a gentle nudge. A fair amount of scrap is moving but the flow could be greater. Mills are reported to have much sounder stockpiles by today's poor standards. Cast shows great reluctance to move.

Detroit—Scrap continues soft, but except for cast, no sales below ceiling have been reported. One dealer said he would sell cast below ceiling "if I could," but that no one wanted any. Yards are trying to supplement volume by increasing automobile graveyard scrap, but baling cost is much higher. It is noticeable that as the volume of defense scrap increases, character of scrap changes. An example is the substitution of turnings for clips.

Cleveland—Openhearth grades are still moving steadily to the mills with

some quarters detecting a stronger movement last week due to the possibility of a steel strike. Electric furnace grades are still in strong demand. Little activity in blast furnace grades is taking place. There is some speculation whether blast furnace grades will be able to hold at ceiling prices when heavy buying resumes. Slight freight concessions have been made on blast furnace grades moving out of the district.

St. Louis—A strike which tied up rail terminals here halted the movement of scrap iron to this district. It had no effect on mills operation which were well supplied with inventories. Weather has been satisfactory for gathering of scrap. Market for openhearth grades is firm at ceiling prices, and there has been no further tightening of the "springboard" of brokers, which remains at \$4. Foundry grades are unwanted.

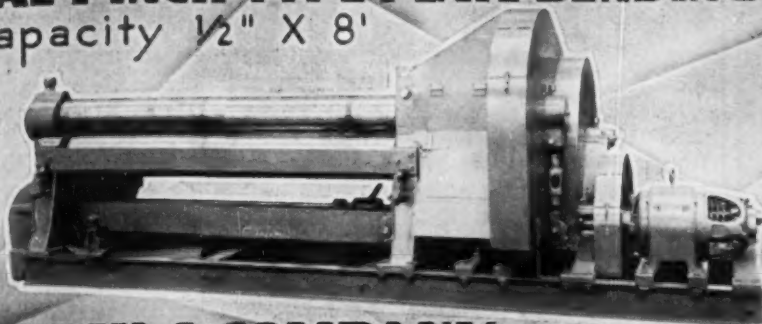
Birmingham—The scrap situation here is unchanged. Enough heavy melting is coming to keep mills supplied and no new allocations have been received in the last 2 or 3 weeks. One mill went out of the market last week, but announced it would begin buying again after Mar. 15. There is no market for cast but yard owners say even if there was they are unwilling to sell at present prices. Many of them paid more for cast than they can get for it now and they prefer to keep it rather than suffer a loss.

Cincinnati—Mills with fairly comfortable inventories are not anxiously pushing for shipments. Allocations are coming in steadily. Tendency toward weakness here is indicated by cancellation of some old orders, restriction of long freight rates and purchasing of only selected grades of scrap. Brokers are still filling old orders for drop broken machinery cast at ceiling. But new orders are expected to be under ceiling. Stove plate is moving at \$45 per gross ton delivered.

Boston—Prices show no change from last week with all grades at ceiling except cupola cast, stove plate and unstripped motor blocks. Trading is good in all steel grades and some cast grades. Improved weather seems to be at the root of higher dealer activity.

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Light and heavy machinery for all classes of sheet metal, plate and structural work

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
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Low-cost, one-piece Washer Type PALNUT Lock-nuts do the job of an ordinary nut, lockwasher and plain washer combined. You save parts and handling operations—get speedy, assembly with hand or power

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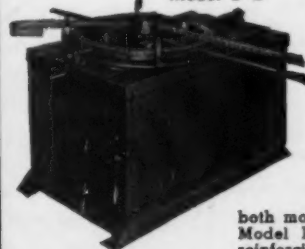
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Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes. Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1 1/4-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to 3/4" thick x 30" wide x 30" long.

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No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x 3/4" Plate Complete with Electrical Equipment.

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#9 William White Bulldozer, Motor Driven with 50 H.P. Motor. 440 v. 3 ph. 60 cycle. Face of Cresshead 20" x 90". Movement of Cresshead 24".

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3/4" McCabe Pneumatic Flanging Machine Pneumatic Holdowns, Circle Flanging Attachment and numerous dies.

No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump.

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2" AJAX Upsetting and Forging Machine. Suspended Header Slide. 20 H.P. Slip Ring A.C. Motor & Control.

FURNACES—MELTING

400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.

15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment.

GEAR REDUCER

600 H.P. Farrell Birmingham Herringbone Gear Unit, R.P.M. 7.20 to 74.54 NEW.

HAMMER

10,000 lb. Chambersburg Steam Drop Hammer.

PLANERS

48" x 48" x 20' Cincinnati, Four Head
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 63" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

ROLLING MILLS

12 1/2" x 16" Philadelphia Two High Cold Rolling Mill, Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.

18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

STRAIGHTENER

3/4" Shuster Straightening & Cut-Off Machine 30' Cut-Off, Complete with 15 H.P. A.C. Motor

TESTING MACHINE

300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

TRIMMING LINE

#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys 1/8" max. Trimmed width 22" min. 66" max. Scrap Length 3/4" min. 2 1/4" max.

WELDERS

700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide.

40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation.

RITTERBUSH & COMPANY INC.
50 Church Street, New York 8, N. Y.
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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Conventions-Exhibits—The National Industrial Service Assn. members will be gathering in Chicago next month (Apr. 20-24) for their 19th annual convention. Convention planners are including a diversified array of exhibits in addition to the discussion periods. Scheduled talks will include management subjects, stressing cost analysis to provide maximum profits, and several technical sessions.

Chicago Market — The demand for used machine tools in this particular area, which had been hit by both tax-time and the defense slowdown, has eased a little further during the past several weeks. This includes class one and two tools mainly. While there has been no great problem in selling these two classes of machine tools, it is generally conceded throughout the market that inquiries have been falling off.

Dealers are continuing their efforts to locate and buy but they still find it difficult to accumulate any kind of inventory. Their inability to build up stock can be clearly seen by empty spaces in most warehouses. There is certainly no jamming or overstocking.

There had been some cutbacks in machine tool buying around mid-December but this buying has been accelerated during recent weeks. Nevertheless local conditions have caused one particular dealer to refer to the market as "terrible." While continuing to buy higher priced equipment, several dealers may move into lower price categories in their own buying.

In-Plant Rebuilding — Rebuilders have been experiencing some cutback effects due to cancellations. Generally, however, it is reported that rebuilding is continuing at a healthy level.

Some manufacturing plants are said to be withholding their inactive machine tools for in-plant reconditioning. These tools can then be sold to dealers at reconditioned prices rather than at "as is"

rates. In some quarters, throughout the Chicago area, there is also a feeling that the current slump will be wiped out when the stretched-out defense program takes up the market slack. If it were to do so, it would be at a slower rate than would have been anticipated under the old defense production plan.

Costly Carats — Used diamond cutting wheels remain in short supply. This shortage is blamed principally on prices of industrial cutting bort. There are claims, too, that bort is obtainable at black market prices running as high as \$6 a carat and in some cases slightly more. With imports of diamond bort down over-all conservation methods will have to be used in overcoming this shortage (IRON AGE, Mar. 6, 1952, p. 203).

Other reports on the Chicago market indicate that heavy industrial equipment continues in good demand.

MDNA Elections—The St. Louis Chapter of the Machinery Dealers National Assn. held its annual elections on Feb. 23. It has been announced that C. L. McDonald, Sr., was elected chairman. Also elected were: Lee McDonald, vice-chairman; D. G. Johnson, secretary, and Sam Zimmerman, treasurer.

The OPS Machine Tool Section reports that the long awaited price guide book is still in the works but that no definite completion date can be given as yet.

Imported Tools—Some used machinery dealers have made a good thing out of imported machine tools. They usually started with a token line of imported tools which were sold because of lower European prices. Now these dealers have a double-edged advantage—prices and delivery time.

European tool output has expanded greatly with American aid and the emphasis has gone on quality.